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Report

Weston & Sampson
ENGINEERS

CITY OF
SPRINGFIELD
CONSTRUCTION
RELEASE ABATEMENT
MEASURE (RAM)
PLAN
FORMER CHAPMAN
VALVE
MANUFACTURING
FACILITY,
225 GOODWIN
STREET
SPRINGFIELD,
MASSACHUSETTS
RTN: 1-00616
SEPTEMBER 2007

Weston & Sampson®

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planning, permitting,
design, construction,
operation, maintenance,
design/build, & equipment

**City of Springfield - Chapman Valve
Weston & Sampson Project No. 2070222.A**

ber 17, 2007

Department of Environmental Protection
ern Regional Office
wight Street, 4th Floor
ngfield, Massachusetts 01103-1317

D&P Release Tracking Number 1-00616
Former Chapman Valve Manufacturing Facility, 225 Goodwin Street, Springfield
Construction Release Abatement Measure (RAM) Plan

Dear Sir or Madam:

On behalf of the City of Springfield, Weston & Sampson is submitting the enclosed Construction Release Abatement Measure (RAM) Plan for the above-referenced disposal site in accordance with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. The original signed and stamped transmittal form BWS-C-106 is attached unbound and a copy is included in Appendix A of the report. The Chief Municipal Officer and Board of Health of the City of Springfield have requirements set forth in the MCP (310 CMR 40.1403(3)(e)). Copies of the public notification letters are also included in Appendix A. If you have any questions regarding this disposal site, please contact George D. Naslas, of Weston & Sampson, at (978) 532-1900, extension 2279.

Very truly yours,

WESTON & SAMPSON

George D. Naslas

George D. Naslas, P.G., LSP
Associate

cc: Mr. David Panagore, City of Springfield
DEP-WERO

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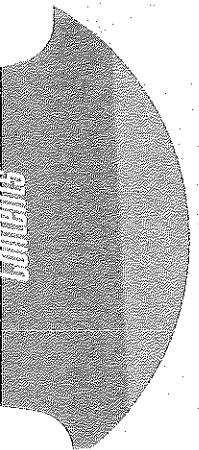
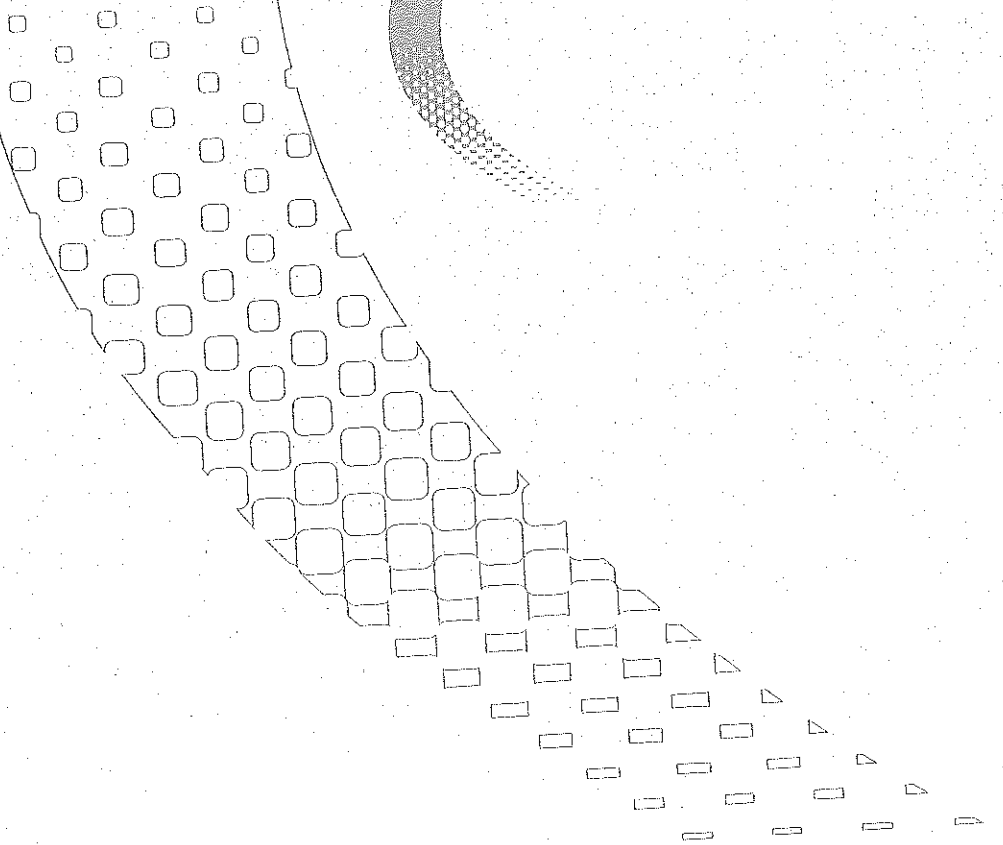
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1.0 INTRODUCTION

1.1 General

Weston & Sampson, on behalf of the City of Springfield, has prepared this Construction Release Abatement Measure (RAM) Plan for the Former Chapman Valve Manufacturing Facility Building Demolition project located at 225 Goodwin Street in Springfield, Massachusetts. This Construction RAM is not being used for the remediation of the site. During the demolition project, it is possible that soil may be generated. The purpose of this Construction RAM is to document our approach for handling the generation of soil and/or the disturbance of contaminated soil and groundwater.

The Site is located in an industrial/residential section of Springfield, Massachusetts. A site locus map is included in Figure 1. The Goodwin Street property is a former steel foundry site consisting of an 11.9 acre parcel and a 141,000 square foot, generally rectangular, industrial building. A release had occurred from a group of six Underground Storage Tanks (USTs), which were located near the northwest corner of the Site building. The oil release at the Site is listed by the Massachusetts Department of Environmental Protection (DEP) under the name American Dream Modular Homes, RTN 1-0616 and is listed as a confirmed Tier II disposal site. The release of petroleum from the subject underground storage tanks was first reported to the MADEP in January 2001.

A Phase I Report and Tier Classification for the No. 6 fuel oil storage tank release on 225 Goodwin Street was prepared by O'Reilly, Talbot, & Okun Associates, Inc. (OTO) in March 2002. The disposal site score was 133, supporting a Tier II Classification. OTO also conducted several investigations and subsurface explorations between 2000 and 2003 in order to characterize the possible presence, nature, and extent of OHM in soil and groundwater. The investigations included soil borings and monitoring well installation, field screening of soil samples, and laboratory analysis of soil samples and groundwater samples. A Phase II Comprehensive Site Assessment Report/Phase III Remedial Action Plan for the oil release was prepared by OTO in June 2003.

The RAM Plan and RAM Transmittal Form (BWSC-106) were prepared in accordance with the Massachusetts Contingency Plan (MCP) 310 CMR 40.0440, and are subject to the Limitations included in Section 3.0 of this Construction RAM Plan. The original signed and stamped BWSC-106 Form is attached with a copy included in Appendix A of this report, along with copies of the legal notification letters to the Chief Municipal Officer and Board of Health.

1.2 Site Location

The Goodwin Street property is industrial zoned and is located within a mixed industrial/commercial/residential zoned section of Springfield, Massachusetts (see Figure 1 – Locus Map).

The site building includes a single story manufacturing area and a small two-story office area. The manufacturing portion of the building is a large open space with high ceilings and a concrete

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Groundwater: Groundwater at the Site is classified as GW-2 and GW-3. GW-1 is not applicable because groundwater is not a potential drinking water source. GW-2 is applicable because there is an unoccupied building on-site. GW-3 is a default category that applies to all groundwater and is associated with its impact on a receiving surface water body.

Soil: All soil categories (S-1, S-2, and S-3) are applicable at the Site. The property is currently unused, but there is evidence of trespassing on Site. There may be low frequency, low intensity exposure to Site soils. Impacted soils were identified near the ground surface and at depth (12-15 feet below grade near the USTs). The shallow soils are considered accessible; soils from three to fifteen feet below grade are considered potentially accessible. Based on this information, shallow site soils are categorized as S-2, and deeper soils S-3 under current conditions. However, to avoid making any limiting assumptions, and for the purpose of the risk characterization performed during the Phase II CSA report, a S-1 soil category was applied to Site soil for current and potential future use.

The applicable MCP soil and groundwater classifications for the Site are identified below and were based on the criteria in 310 CMR 40.0932 for soil, and 310 CMR 40.0933 for groundwater.

1.3 MCP Soil and Groundwater Classification

The site abutters consist of: the Truss Engineering Corporation to the east; Goodwin Street followed by vacant land which was formerly part of the Chapman Valve Manufacturing Facility to the north; residential properties to the west; and the former Chapman Valve Casting Sand Landfill to the south.

At least two small basements are located in the southeast and southwest corners of the manufacturing area. Portions of the structure were damaged by a fire started on the interior of the building. Piles of debris and holes in the ceiling remain from that event. The building is of steel frame construction. Most of the exterior walls are constructed of transite board. The roof has multiple levels and is constructed with an asphalt membrane.

2.0 CONSTRUCTION RELEASE ABATEMENT MEASURE PLAN

This project is being bid through M.G.L. Chapter 144. The property is a listed site with the Massachusetts Department of Environmental Protection. Most activities will be conducted above ground surface. However, this construction RAM is to ensure compliance with the Massachusetts Contingency Plan (MCP), as appropriate. This construction RAM has been prepared in general accordance with the DEP Policy #WSC-00-425, "Construction of Buildings in Contaminated Areas" dated January 2000.

The Construction RAM Plan was prepared in accordance with 310 CMR 40.0440 of the MCP. The RAM transmittal form, BWSC-106, was e-filed with DEP. The project is essentially a building demolition with potentially the removal of Underground Storage Tanks and impacted soil. The property is a listed site and as such a Construction RAM is required to address handling of impacted soil and/or groundwater. This Construction RAM addresses those issues and other potential issues that could arise during construction such as spills etc. The Construction RAM requirements are included in the Contract Documents (being bid through Chapter 149). This Construction RAM is to address soil and groundwater encountered during building demolition and UST removal only and is not meant as a vehicle to remediate the Site. The MCP requirements for the Construction RAM Plan are shown in *italic* text and the required information is shown in normal text.

(a) The name, address, telephone number and relationship to the site of the person assuming responsibility for conducting the Release Abatement Measure;

The City of Springfield is assuming responsibility for conducting the RAM. The point of contact, address, and telephone number are as follows:

Bob Carney
Deputy Purchasing Agent, Office of the City of Springfield Purchasing Department
36 Court Street
Room 405, City Hall
Springfield, Massachusetts 01103
Telephone (413) 787-7843

(b) A description of the release or threat of release, site conditions and surrounding receptors;

On January 10, 2001, the City of Springfield submitted a Release Notification form to the DEP regarding a release of petroleum hydrocarbons from underground storage tanks located near the northwest corner of the site building. This notification was based upon subsurface information collected from the Phase II Comprehensive Site Assessment (CSA). The data indicated that petroleum constituents were present in soil adjacent to the underground storage tanks above the RCS-1 reportable standard. The data from the Phase II CSA is included in Appendix B

Description of the Release

Releases of OHM to Soil

Selected soil samples from the soil borings that were performed by O'Reilly, Talbot & Okun Associates, Inc (OTO) were submitted to Amro Environmental Laboratories of Merrimack, New Hampshire for laboratory analysis. Parameters analyzed included Volatile Organic Compounds (VOCs), Extractable and Volatile Petroleum Hydrocarbons (EPA/VPH), Polychlorinated Biphenyls (PCBs), and RCRA-8 metals.

The soil analytical data is included in Appendix B. Three chlorinated VOCs, various petroleum constituents (VOCs, VPH, and EPH), one PCB Aroclor, and four metals were detected. Six analytes were detected in at least one soil sample above their respective Reportable Concentration RCS-1 Standard, (1,1-dichloroethene; C₉-C₁₀ aromatic hydrocarbons; C₁₁-C₂₂ aromatic hydrocarbons; methylene chloride; 2-methylnaphthalene, and benzo(a) anthracene). These analytes were detected in samples from borings EP-1 or EP-4, both of which were located near/between the USTs. Each of these analytes is likely a constituent of petroleum, except 1,1-dichloroethene, which is a chlorinated VOC. The soil boring data is included in Appendix B.

Low levels of chlorinated VOCs have historically been detected in groundwater at the site. C₉-C₁₀ aromatic hydrocarbons, C₁₁-C₂₂ aromatic hydrocarbons, 2-methylnaphthalene, and benzo(a) anthracene are petroleum constituents that are likely associated with leaks from the tanks. Petroleum stained soils and/or odors were observed at depths of 9 to 17 feet in borings EP-1 and EP-4, indicating that at least one of the USTs in the area had leaked. As a result of these detections, a Release Notification Form was submitted to MADEP by the City of Springfield in January 2001.

Four near surface soil samples were collected to assess soil quality at other locations on the site. Sample results indicated that there were no detections above MCP reportable concentrations in these soils.

Releases of OHM to Groundwater

Groundwater samples were collected by OTO in August 2000 and February 2003 and submitted to Amro Environmental Laboratory for analysis of VOCs by EPA Method 8260, EPH/VPH, and dissolved RCRA-8 metals. Groundwater analytical data indicated that low levels of chlorinated VOCs were reported in three of the wells sampled. Petroleum constituents (VPH and EPH) were identified in groundwater in three locations in the tank vicinity. Two metals (arsenic and barium) were reported in groundwater, but at low concentrations likely due to background geologic conditions.

Acetone was reported in groundwater from four monitoring wells that were installed by Corporate Environmental Advisors, Inc. (CEA). This compound was not detected in any of the wells installed by OTO, even ones in the same vicinity of the site. Based on the absence of a pattern to detection and its presence only in CEA wells, it was believed by OTO that the source of acetone might have been bentonite pellets used during well installation. In the Phase II CSA

report, OTO stated that certain brands of coated bentonite pellets have been found to contribute significant concentrations of acetone to groundwater (DEP, 2003). Acetone concentration did not exceed MCP Method I Standards.

Site Conditions and Surrounding Receptors

The Goodwin Street property is a former steel foundry site consisting of an 11.9-acre parcel and a 114,000 square foot, generally rectangular, industrial building. The approximate geographical coordinates for the property are as follows:

| | | |
|---------------------|---------------|---------------|
| UTM Coordinates: | 4,669,460 m N | 706,640 m E |
| Latitude/Longitude: | 42° 09' 07" N | 72° 29' 57" W |

The land around the site building is generally overgrown with brush and small trees. An abandoned railroad siding is present on the east and west sides of the building. The railroad tracks have been removed, however, the stone ballast is still present. Significant quantities of construction debris, electrical equipment, manufacturing equipment, miscellaneous trash, and concrete rubble are located around the building exterior.

The site abutters consist of: the Truss Engineering Corporation to the east; Goodwin Street followed by vacant land which was formerly part of the Chapman Valve Manufacturing Facility to the north; residential properties to the west; and the former Chapman Valve Casting Sand Landfill to the south.

No institutions specified in 310 CMR 40.0483 (1)(a)(7) are located within 500 feet of the Site. No natural resource areas as described in 310 CMR 40.0483 (1)(a)(8) are located within 500 feet of the Site. Based on review of Massachusetts GIS maps, a reconnaissance of the area, and review of USGS topographic maps, and discussion with local officials, none of the following natural resource areas are located within 500 feet of the Site:

1. Mapped surface waters, including wetlands, vernal pools, ponds, lakes, streams, rivers and reservoirs;
2. Public drinking water supplies consisting of Zone II areas, Interim Wellhead Protection areas, Zone A areas, or Potentially Productive Aquifers; or
3. Areas of Critical Environmental Concern, Sole Source Aquifers, local, state or federal open protected space, fish habitats and habitats of Species of Special Concern or Threatened or Endangered Species.

(c) The objective(s), specific plan(s), and proposed implementation schedule for the Release Abatement Measure, including, as appropriate, plans and/or sketches of the site and any proposed investigative and/or remedial installations;

This Construction RAM Plan outlines general procedures, but specific plans and specifications that mirror these procedures are included in Appendix C. Weston & Sampson anticipates the following activities may be required as part of site clearance and demolition.

Excavation of OHM-Contaminated Soils

Soil excavation is generally recommended for areas that are easily accessible and have relatively low volumes of contaminated soil. If OHM-contaminated soils are suspected or encountered during construction activities, the following steps will be taken during excavation of OHM-contaminated soils.

Field-Screening and Soil Sampling (No Groundwater Encountered)

a. During excavation, soil samples will be screened every 20 cubic yards (more frequently when staining or other evidence of contamination is observed) for the presence of total volatile organic compounds (TVOCs) using a photoionization detector (PID). TVOC concentrations will be measured using the headspace test described in DEP Waste Site Cleanup Policy #WSC-94-400, "Interim Remediation Waste Management Policy for Petroleum-Contaminated Soils." Contaminated soils will be excavated to the extent possible.

b. Ambient air levels will be measured using a PID during excavation of contaminated soils to confirm air levels are below 10 ppm at a frequency depending on site conditions.

c. WSE will collect up to four sidewall and two bottom soil samples from each excavation for confirmatory analyses. Depending on the contaminants suspected and being removed, these samples will be submitted to a state-certified laboratory for analysis of volatile petroleum hydrocarbons/extractable petroleum hydrocarbons (VPH/EPH) with target volatile organic compounds (VOCs) and target polycyclic aromatic compounds (PAHs) using the DEP-approved method (January 1998), metals or PCBs. Sidewall soil samples submitted for laboratory analysis will be representative of the highest PID reading remaining in the excavation.

d. The excavation will be left open until soil analytical results are obtained and evaluated. Safety measures (temporary barricades, fencing, warning signs, etc.) will be implemented to prevent access to the open excavation.

e. The excavation will be backfilled with clean soil if PID readings are low (i.e., less than 10 ppm) and there is little visible or olfactory evidence of OHM contamination in the excavation. Soils with PID readings between 10 and 100 ppm may be used as backfill if

laboratory analytical results indicate contaminant concentrations are within applicable MCP cleanup standards.

Evaluation of Soil Analytical Data

a. The soil analytical results from the excavation walls and bottom will be compared to Method 1 cleanup standards. If contaminant concentrations are below applicable Method 1 cleanup standards, the excavation will be backfilled and no further remedial action will be performed.

b. If Method 1 cleanup standards are exceeded, a Method 3 risk assessment may ultimately be performed to determine if the soils left in place pose a significant risk to human health, safety and public welfare under current or future site conditions. If a particular area of the Site does not pose a significant risk under any foreseeable use, no further action will be required after the excavation is backfilled.

c. If the contaminated soils left in place pose a potential risk under certain future conditions, additional response actions will be considered and/or an Activity and Use Limitation (AUL) will be obtained to restrict future use(s) of the property so that it will not pose a significant risk in the future. Any such additional response actions are likely to be conducted in conjunction with planned construction activities at the Site.

Groundwater Encountered in Excavation

a. If groundwater is encountered in the excavation, the contractor will provide means to dewater the excavation.

b. Contaminated groundwater will be treated in accordance with applicable permits to remove fine-grained sediments and contaminants of concern. It is anticipated that treated groundwater will be discharged to either a storm drain or Springfield Water & Sewer Commission sewer system and that this discharge will be permitted as required. Samples from the treatment system will be collected in accordance with the discharge permit.

Stockpiling and Removal of Excavated Soils

a. Contaminated soils will be stockpiled separately from "clean" soils (those soils not anticipated to be OHM-contaminated) based on PID screening readings and visual or olfactory evidence of contamination. All soils will be stockpiled on 6-mil polyethylene sheeting, preferably placed on pavement, and covered with 6-mil polyethylene sheeting. The stockpiles will be bermed to abate migration of contaminated runoff.

b. All contaminated excavated soil will be removed from the site within 120 calendar days (90 days for RCRA hazardous) of the initial excavation.

Depending on the source of the release (if known), these samples may be submitted to a state-certified laboratory for analysis of volatile petroleum hydrocarbons /extractable petroleum hydrocarbons (VPH/EPH) with target analytes using the DEP-approved shallow excavations (less than 1 foot), bottom samples only will be collected.

- c. Closure samples will be collected from the excavation after contaminated soils are removed. A minimum of 1 sample will be collected from the bottom of the excavation and a minimum of 1 sample will be collected from each sidewall of the excavation. For Ambient air levels will be measured using a PID during excavation of contaminated soils to confirm levels are below 10 ppm.
- b. If a field-screening reading of 100 ppm or greater is obtained from a soil sample during a tank removal, excavation of soils will be continued. Soils will be field-screened every 20 cubic yards (cy), or when staining is observed, for the presence of total volatile organic compounds (TVOCs) using a photoionization detector (PID). TVOC concentrations will be measured using the headspace test described in DEP Waste Site Cleanup Policy #WSC-94-400, "Interim Remediation Waste Management Policy for Petroleum-Contaminated Soils." Contaminated soils will be excavated to the extent possible.
- a.

Field-Screening and Soil Sampling (No Groundwater Encountered)

Contaminated soils and/or groundwater encountered during UST removal activities constitute a 72-hour release if field-screening readings in excess of 100 ppm in soil are greater than 2 feet below grade and within 10 feet of a UST during removal. If a 72-hour release condition occurs during UST removal, the steps that will be taken to address such conditions and to reduce or eliminate the potential risk to human health, safety and public welfare are described below.

Underground Storage Tank Removal

- e. If soil is to be disposed of as a hazardous waste, it will be transported to an out-of-state licensed facility with a Massachusetts Hazardous Waste Manifest by a licensed hazardous waste transporter.
- d. Contaminated soils will be disposed of at a legally permitted disposal facility. If soil is disposed of at an in-state facility or is recycled in an asphalt-batching facility, it will be transported under a Bill-of-Lading (BOL) signed by a Licensed Site Professional (LSP).
- c. Disposal characterization of stockpiled soils will be performed to determine off-site disposal options. For disposal at landfills, the sample collection and analyses will be performed in accordance with DEP's Policy COMM-97-001, "Reuse and Disposal of Contaminated Soil at Massachusetts Landfills". For all other disposal destinations, samples will be collected and analyzed in accordance with the disposal facility's permit requirements.

- a. NAPL encountered in an excavation will be removed using a vac truck or other appropriate recovery method.

NAPL Encountered During Excavation Activities

If NAPL is encountered either in an excavation or in a monitoring well at a thickness exceeding 0.5 inches, a 72-hour condition exists and an IRA may be implemented as described below.

Recovery of Separate-Phase Product

- d. The excavation will be backfilled per the contract documents and safeguarded by appropriate methods (temporary barricades, fencing, warning signs, etc.) to prevent accidents or damage to property if it is to be left open overnight.
- e. Contaminated soil and/or groundwater (if encountered) will be managed as described in the previous sections.

| <u>Tank Contents</u> | <u>Analytical Parameters</u> |
|----------------------|--|
| Gasoline or Fuel Oil | Refer to DEP's VPH/EPPH Document (September 1997), Tables 4-2 and 4-3 |
| Chlorinated Solvents | VOCs by EPA Method 8260 Priority Pollutant Metals |
| Waste Oil | VPH EPH + Target Analytes VOCs by EPA Method 8260 Priority Pollutant Metals |
| Unknown | VPH + Target Analytes EPH + Target Analytes VOCs by EPA Method 8260 Priority Pollutant Metals |

method, metals and/or PCBs. Side wall soil samples submitted for laboratory analysis will be representative of the highest PID reading remaining in the excavation. The target analytes will be determined on a case-by-case basis in accordance with Tables 4-2 and 4-3 of DEP's "Characterizing Risks Posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPPH Approach" document, dated September 25, 1997. A summary of analytical parameters for petroleum and other products is presented below.

- a. Contact certified clean-up contractor immediately.
- Spill Response Procedures-Large spills
- d. The used containment materials should be collected and placed in labeled containers and properly transported off-site for disposal by a certified contractor.
 - b. Don protective clothing and contain minor spills using absorbent methods such as absorbent pads, booms, mops, Speedi-Dri, and sand. Absorbent booms and/or pads should be placed downgradient of the release to prevent or minimize OHM dispersion. Speedi-Dri and/or sand should be placed on the spill and then collected with a shovel and placed in a container for later disposal.
 - a. The source of release should be identified and stopped or temporarily plugged. If quick repair or plugging of the AST or drum is not feasible, the AST or drum should be emptied into sound containers until the original AST or drum is permanently repaired or replaced.

Spill Response Procedure

- c. Perform UST excavation in accordance with the "Underground Storage Tank Removal" procedures provided in this IRA Plan.
- b. Contact spill response contractor to pump out OHM from the UST.
- a. Verify release is a 2-hour reportable condition and contact DFP. Contact Fire Department if Imminent Hazard condition exists.

Spill Response Procedures-UST Releases

Minor spills are defined as releases that can easily be contained using on-site personnel and equipment. Large spills are defined as releases that cannot be contained without outside assistance. It is assumed that the on-site construction supervisors will be equipped with a spill kit containing a minimum items such as personnel protective clothing, brooms, mops, buckets, shovels, absorbent booms and absorbent materials (i.e., Speedi-Dri). If a sudden release of OHM occurs, the following spill response procedures presented below will be implemented for UST releases, minor AST or drum releases, and major spills.

Containing Sudden Releases of OHM

- b. Recovered product will be collected in frac tanks (or similar) or 55-gallon drums (depending on volume) and temporarily stored on site. Within 90 days of recovery, a licensed disposal contractor will transport and dispose of these drums under a uniform hazardous waste manifest.

- Application and Permit for Storage Tank Removal and Transportation to Approved Tank Disposal Yard in Accordance With the Provisions of M.G.L. Chapter 148,

If it is decided that the USTs are to be removed, the following forms are required:

Abatement Measures;

(f) A listing of federal, state and local permits likely to be needed to conduct the Release

If USTs are to be removed, field-screening of excavated soils will be conducted using a photoionization detector (PID) and visual and olfactory observations. During construction activities, the contractor will be responsible for minimizing dust generation. An environmental monitoring plan is not applicable for post-construction activities.

(e) Where appropriate, a proposed environmental monitoring plan for implementation during and/or after the Release Abatement Measures;

The management of soil and groundwater was described in the previous section and in the Specifications sections in Appendix C.

If contaminated soil is encountered during excavation and/or UST removal, samples will be submitted to a state-certified laboratory for analysis of EPH/VPH with target VOCs and target PAHs, based on the highest reading from the photoionization detector. The excavation will be backfilled with clean soil if PID readings are low (i.e., less than 10 ppm) and there is little visible or olfactory evidence of OHM contamination in the excavation. Soils with PID readings between 10 and 100 ppm may be used as backfill if laboratory analytical results indicate contaminant concentrations are within applicable MCP cleanup standards. The soil analytical results from the excavation walls and bottom will be compared to Method 1 cleanup standards. If contaminant concentrations are below applicable Method 1 cleanup standards, the excavation will be backfilled and no further remedial action will be performed.

(d) A Statement as to whether Remediation Waste, Remedial Wastewater and/or Remedial Additives will be excavated, collected, stored, treated, discharged, applied, reused, or otherwise managed at the Site;

Relative specification sections from the bid documents are included in Appendix C.

c. The cleanup contractor will pump out the remaining contents of the container and assist with cleanup and disposal of any contaminated materials.

b. To the extent possible, contain the spill. Booms and absorbent pads should be placed downgradient of the release to contain the spill and eliminate migration of oil product onto the adjacent property. Drain covers/mats will be placed on nearby and downgradient catch basins and manholes to eliminate migration of product into the storm drains and catch basins.

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No additional information has been requested.

(i) Any other information that the Department, during its review and evaluation of the Release Abatement Measure determines to be necessary to complete said plan, in view of site specific circumstances and conditions;

The excavation and management of greater than 1,500 cubic yards of remediation waste at the Site is not anticipated during construction activities.

(h) The certification required at 310 CMR 40.0442(4), if greater than 1500 cubic yards of Remediation Wastes are to be excavated and managed at the disposal site; and

George D. Nolas, P.G. is the Licensed Site Professional (LSP) of record for the Site. His electronic signature and seal were included in the RAM Transmittal Form (BWSC-106) that was electronically submitted to DEP.

(g) The seal and signature of the Licensed Site Professional who prepared the Release Abatement Measure Plan;

If groundwater is discharged to either a storm drain or a Springfield Sewer, appropriate federal and/or local permits will be required, see specification section Appendix C. No other federal, state, or local permits are likely to be needed to conduct the Construction RAM.

- Section 38A, 527 CMR 9.00.
- Notification for Storage Tanks Regulated Under 527 CMR 9.00 (FP-290) Form
- Notification for Removal or Closure of In Place Storage Tanks Regulated under 527 CMR 9.00 (FP-290R) Form

3.0 LIMITATIONS

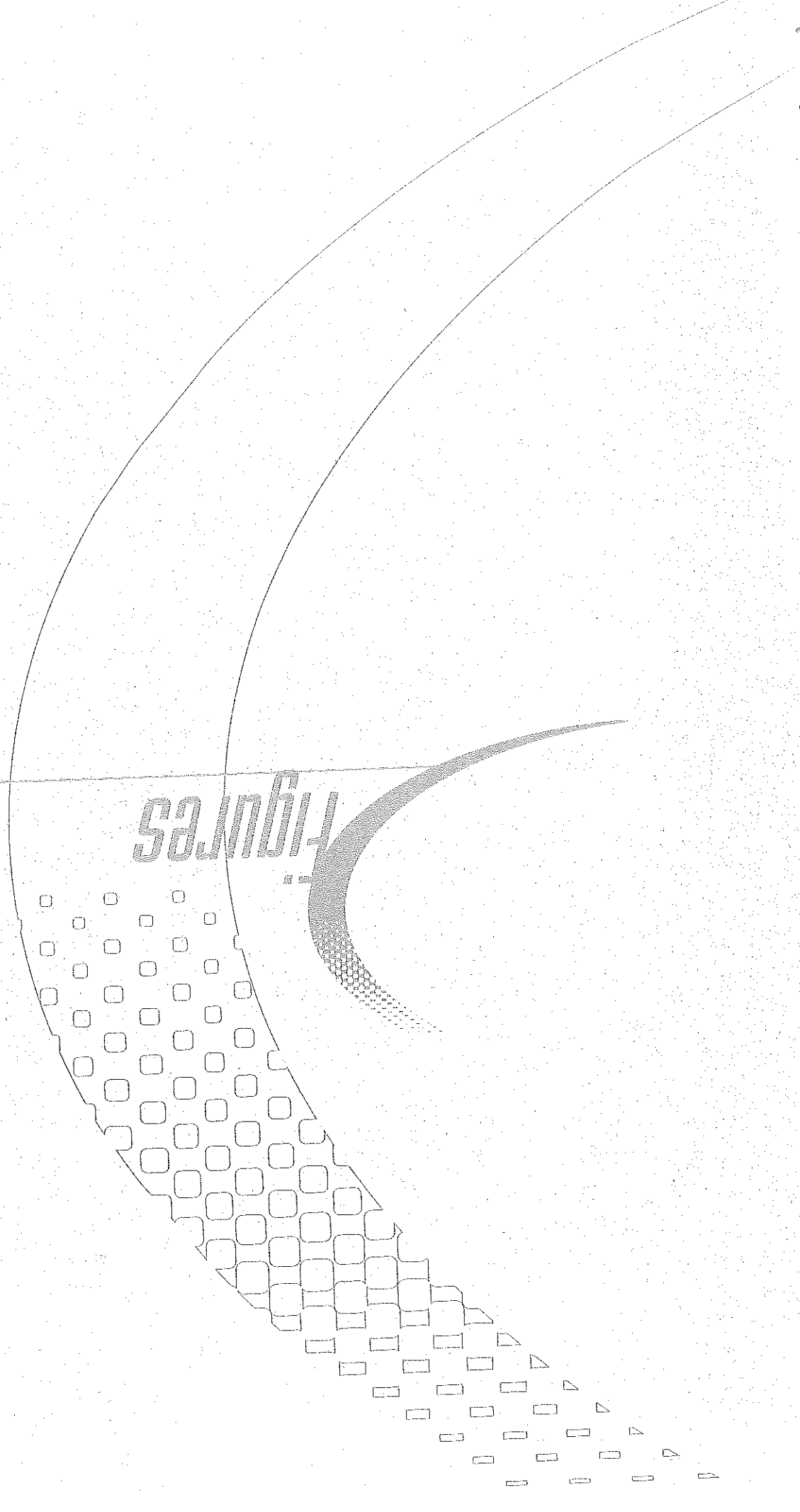
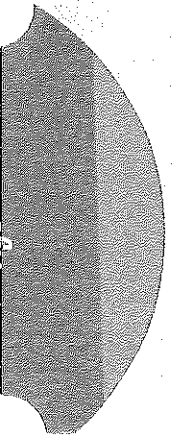
This Report was prepared for the use of the City of Springfield, exclusively. The findings provided by Weston & Sampson in this report are based solely on the information reported in this document. Future sampling, and/or information that was not available to Weston & Sampson at the time of the study, may result in a modification of the findings stated in this report.

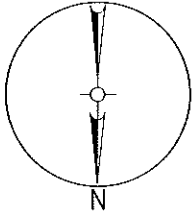
Should additional information become available concerning this Site or neighboring properties, which could directly impact the Site in the future, that information should be made available to Weston & Sampson for review so that, if necessary, conclusions presented in this report may be modified. The conclusions of this report are based on Site conditions observed by Weston & Sampson personnel at the time of the study, information provided by the City of Springfield and samples collected and analyzed on the dates shown or stated in this report. This report has been prepared in accordance with generally accepted engineering and geological practices. No other warranty, express or implied, is made.

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Figures





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SCALE: 1 : 25,000
SOURCE: 1996 Earthvisions, Inc.

LOCUS MAP

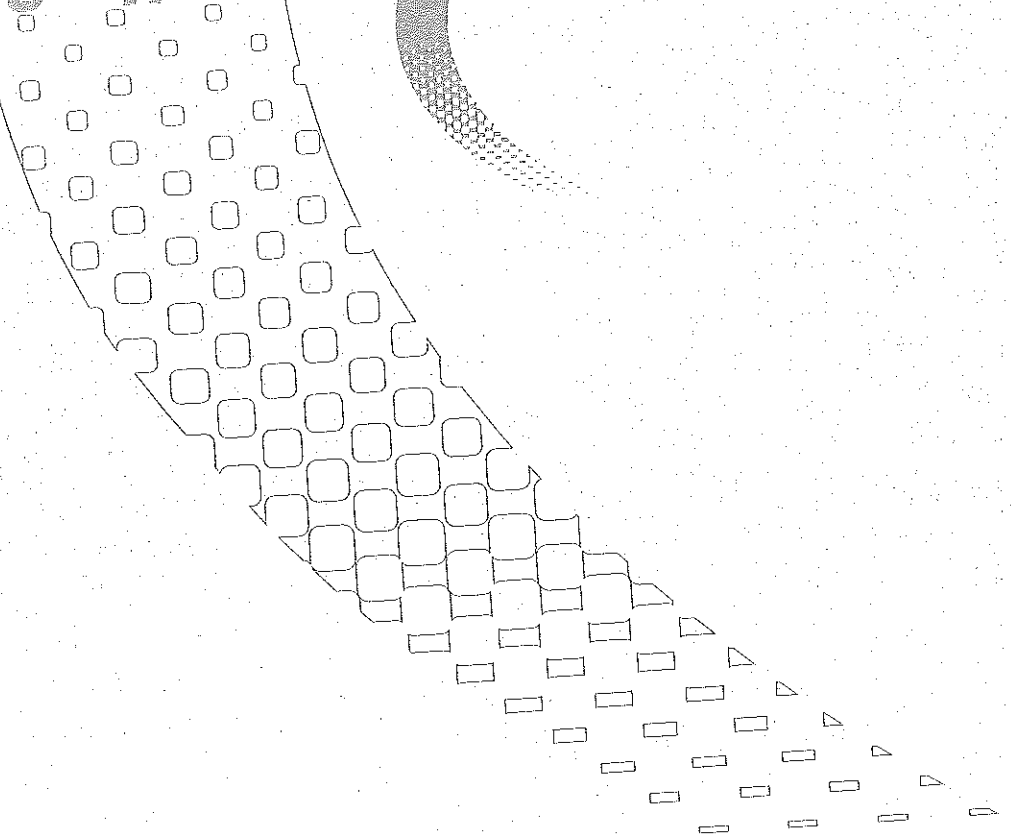
225 Goodwin Street
SPRINGFIELD, MASSACHUSETTS

FIGURE 1

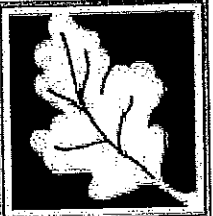


Weston & Sampson

Appendix A



Appendix A



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number
BWSC106 - 1 - 00616

A. SITE LOCATION:

1. Site Name/Location Aid: Former Chapman Valve Manufacturing Facility

2. Street Address: 225 Goodwin Street

3. City/Town: Springfield 4. ZIP Code: 01151-0000

5. UTM Coordinates: a. UTM N: 4669460 b. UTM E: 706640

6. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.
a. Tier IA b. Tier IB c. Tier IC d. Tier II

7. If a Tier I Permit has been issued, provide Permit Number: _____

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial RAM Plan (if previously submitted): _____ (mm/dd/yyyy)
 2. Submit an Initial Release Abatement Measure (RAM) Plan.

a. Check here if the RAM is being conducted as part of the construction of a permanent structure. If checked, you must specify what type of permanent structure is to be erected in or in the immediate vicinity of the area where the RAM is to be conducted.

b. Specify type of permanent structure: (check all that apply) i. School ii. Residential iii. Commercial iv. Industrial v. Other Specify: _____

3. Submit a Modified RAM Plan of a previously submitted RAM Plan.
4. Submit a RAM Status Report.
5. Submit a Remedial Monitoring Report. (This report can only be submitted through eDEP, concurrent with a RAM Status Report.)

a. Type of Report: (check one) i. Initial Report ii. Interim Report iii. Final Report

b. Number of Remedial Systems and/or Monitoring Programs: _____
A separate BWSC106A, RAM Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

6. Submit a RAM Completion Statement.
7. Submit a Revised RAM Completion Statement.

8. Provide Additional RTNs:
a. Check here if this RAM Submittal covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here. This section is intended to allow a RAM to cover more than one unclassified RTN and not show permanent linkage to a Primary Tier Classified RTN.

b. Provide the additional Release Tracking Number(s) covered by this RAM Submittal.
[] - [] - []

(All sections of this transmittal form must be filled out unless otherwise noted above)

RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number

BWSC106

1 - 00616



D. DESCRIPTION OF RESPONSE ACTIONS (cont): (check all that apply, for volumes list cumulative amounts)

13. Excavation of Contaminated Soils

a. Re-use, Recycling or Treatment

i. On Site Estimated volume in cubic yards

ii. Off Site Estimated volume in cubic yards >1,500

!!a. Receiving Facility: _____

State: _____

!!b. Receiving Facility: _____

State: _____

!!!. Describe: _____

i. On Site Estimated volume in cubic yards

ii. Off Site Estimated volume in cubic yards

!!a. Receiving Facility: _____

State: _____

!!b. Receiving Facility: _____

State: _____

c. Landfill

i. Cover Estimated volume in cubic yards

State: _____

Receiving Facility: _____

Town: _____

ii. Disposal Estimated volume in cubic yards

State: _____

14. Removal of Drums, Tanks or Containers:

a. Describe Quantity and Amount: _____

b. Receiving Facility: _____

State: _____

c. Receiving Facility: _____

State: _____

15. Removal of Other Contaminated Media:

a. Specify Type and Volume: _____

b. Receiving Facility: _____

State: _____

c. Receiving Facility: _____

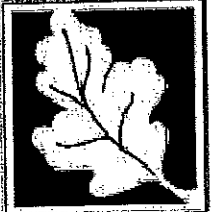
State: _____

16. Other Response Actions:

Describe: _____

17. Use of Innovative Technologies:

Describe: _____



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

RELEASE ABATEMENT MEASURE (RAM)
TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number

BWSC106

1 - 00616

F. PERSON UNDERTAKING RAM:

- 1. Check all that apply: a. change in contact name b. change of address c. change in the person undertaking response actions

2. Name of Organization: City of Springfield

3. Contact First Name: David
4. Last Name: Panagore

5. Street: 70 Tapley Street
6. Title: Dir., Planning & Econ. Development

7. City/Town: Springfield
8. State: MA
9. ZIP Code: 01104-0000

10. Telephone: (413) 787-6020
11. Ext: _____
12. FAX: (413) 787-6524

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING RAM:

- 1. RP or PRP a. Owner b. Operator c. Generator d. Transporter
- e. Other RP or PRP Specify: _____

2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(f))

4. Any Other Person Undertaking RAM Specify Relationship: _____

H. REQUIRED ATTACHMENT AND SUBMITTALS:

1. Check here if any Remediation Waste, generated as a result of this RAM, will be stored, treated, managed, recycled or reused at the site following submission of the RAM Completion Statement. You must submit a Phase IV Remedy Implementation Plan along with the appropriate transmittal form (BWSC108).

2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the implementation of a Release Abatement Measure.

4. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to the DEP Regional Office.

5. If a RAM Compliance Fee is required for this RAM, check here to certify that a RAM Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.

6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

City of Springfield – Chapman
Weston & Sampson Project No. 2070222.A

September 17, 2007

Ms. Helen R. Cautlon-Harris, Director
Springfield Board of Health and Human Services
95 State Street
Springfield, Massachusetts 01103

Re: DEP Release Tracking Number 1-00616
Former Chapman Valve Manufacturing Facility, 225 Goodwin Street, Springfield
Public Notification for Construction Release Abatement Measure (RAM) Plan

Dear Ms. Cautlon-Harris:

On behalf of the City of Springfield, Weston & Sampson is informing your office that a Construction Release Abatement Measure (RAM) Plan has been submitted to the Massachusetts Department of Environmental Protection (DEP) for the above-referenced disposal site in accordance with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

The RAM Plan has been submitted on behalf of our client, the City of Springfield Office of Planning and Economic Development, to the Department of Environmental Protection's Western Regional Office (DEP-WERO) in Springfield, Massachusetts, where it will be available for public review. This notification is being made in accordance with the public notification requirements set forth in the MCP (310 CMR 40.1403(3)(e)). If you have any questions regarding this disposal site, please contact George D. Naslas, of Weston & Sampson, at (978) 532-1900, extension 2279.

Very truly yours,

WESTON & SAMPSON

George D. Naslas

George D. Naslas, P.G., LSP

Associate

cc: Mr. David Panagore, City of Springfield
DEP-WERO

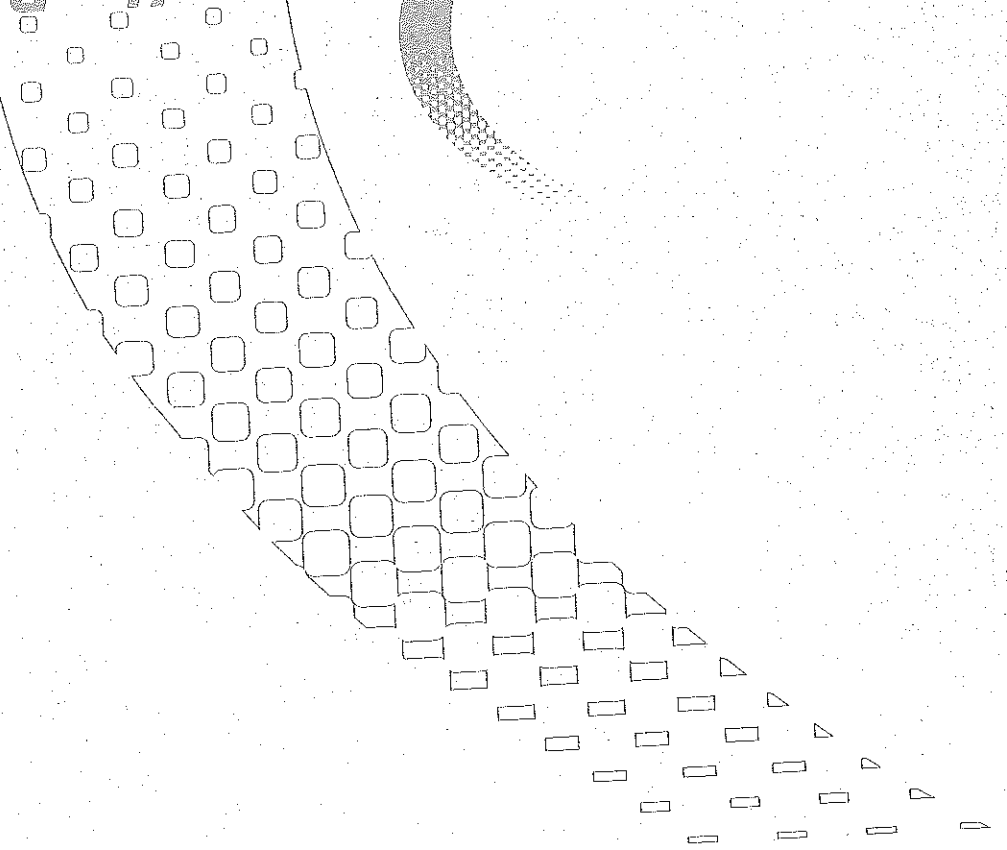
O:\Springfield MA\Chapman\Correspondence\Pub Not BOH - RAM Plan.doc

Massachusetts (HQ) Five Centennial Drive Peabody, MA 01960-7985
Massachusetts 100 Foxborough Blvd. Suite 250 Rocky Hill, CT 06067
Connecticut 273 Dvidend Road Coventry, RI 02816
Rhode Island 477B Tiogue Avenue Portsmouth, NH 03801
New Hampshire 195 Hanover Street Suite 28 York, ME 03909
Maine PO Box 189 Waterbury, VT 05676
Vermont 38 North Main Street 301 Manchester Road Suite 201A Poughkeepsie, NY 12603
New York

When it's essential...it's Weston & Sampson®

Weston & Sampson

Appendix B



Historic Sampling Results
Summary Tables, Boring Logs, and Laboratory Analytical Data

APPENDIX B

TABLES

Table 2
 Groundwater Field Screening Data
 225 Goodwin Street, Springfield, MA

| Monitoring Well | pH (Standard Units) | Specific Conductance (umhos/cm) |
|-----------------|---------------------|---------------------------------|
| September 2000 | | |
| CEA-1 | 6.9 | 235 |
| CEA-2 | 6.9 | 403 |
| CEA-3 | 7.4 | 260 |
| CEA-4 | 7.1 | 335 |
| CEA-5 | 6.6 | 395 |
| OTO-1 | 6.9 | 162 |
| OTO-2 | 7.4 | 78 |
| OTO-3 | 6.7 | 190 |
| OTO-4 | 6.8 | 188 |
| OTO-5 | 6.5 | 215 |
| OTO-6 | 6.2 | 171 |
| OTO-7 | 7.1 | 416 |
| OTO-8 | 7.1 | 112 |
| February 2003 | | |
| CEA-2 | 7.1 | 777 |
| OTO-17 | 7.4 | 464 |

Table 3
Groundwater Analytical Data (EPCs)
225 Goodwin Street, Springfield, MA

| Concentration in ug/liter (ppt) | duplicate | | | | | | | | | | duplicate | | | | | | | | | | GW-2/3 Standards |
|---|------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|---------|---------|---------|---------|---------|---------|--------------|-----------|----|------------------|
| | Monitoring Well: | OTO-1 | OTO-2 | OTO-3 | OTO-4 | OTO-5 | OTO-5D | OTO-6 | OTO-7 | OTO-8 | OTO-17 | CEA-1 | CEA-2 | CEA-2 | CEA-3 | CEA-4 | CEA-5 | Triple Blank | Eq. Blank | | |
| Date Collected: | 8/17/00 | 8/17/00 | 8/17/00 | 8/17/00 | 8/17/00 | 8/17/00 | 8/17/00 | 8/17/00 | 8/17/00 | 8/17/00 | 2/10/03 | 8/17/00 | 2/10/03 | 2/10/03 | 8/17/00 | 8/17/00 | 8/17/00 | 2/10/03 | 2/10/03 | | |
| Volatile Organic Compounds (VOCs) | | | | | | | | | | | | | | | | | | | | | |
| 1,1-Dichloroethane | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9000 |
| 1,1,1-Trichloroethane | ND | ND | ND | ND | 3.2 | 3.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 29 | ND | ND | 4000 |
| Acetone | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 | 62 | ND | 130 | 12 | ND | ND | ND | ND | 50000 |
| Volatile Petroleum Hydrocarbons (VPH) | | | | | | | | | | | | | | | | | | | | | |
| C5-C8 Aliphatics | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 200 | ND | ND | ND | ND | ND | ND | ND | 1000 |
| C9-C10 Aromatics | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 43 | 170 | 150 | ND | ND | ND | ND | ND | 4000 |
| VPH Target Analytes | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | vary |
| Extractable Petroleum Hydrocarbons (EPH) | | | | | | | | | | | | | | | | | | | | | |
| C9-C18 Aliphatics | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 200 | ND | ND | ND | ND | 1000 |
| C19-C26 Aliphatics | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 120 | ND | 160 | 140 | ND | ND | ND | ND | ND | 20000 |
| C17-C22 Aromatics | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 120 | ND | 970 | 940 | 250 | 940 | ND | ND | ND | 30000 |
| Acenaphthene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.7 | 1.9 | ND | ND | ND | ND | ND | 5000 |
| Fluorene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.2 | 1.3 | ND | ND | ND | ND | ND | 3000 |
| 2-Methylanthracene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.6 | ND | ND | ND | ND | 3000 |
| Naphthalene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.5 | 1.1 | ND | ND | ND | ND | ND | 6000 |
| Phenanthrene | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.1 | 2.3 | ND | ND | ND | ND | ND | 50 |
| Dissolved Metals | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | ND | ND | ND | 31 | ND | 29 | ND | ND | ND | ND | ND | 42 | ND | ND | 38 | 42 | ND | 38 | ND | ND | 400 |
| Barium | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 29 | ND | ND | 280 | 250 | ND | ND | ND | ND | 30000 |

- Note:
1. Concentrations in ug/l. These concentrations are "EPCs" or Exposure Point Concentrations for risk assessment purposes.
 2. ND -Not detected. Only compounds detected in at least one sample are shown here. Refer to laboratory reports for full listing of target analytes.
 3. "-" indicates not tested for this analyte.
 4. Standards are lower of MCL Method 1 GW-2 and GW-3 criteria.

Table 4
 Groundwater Elevation Data
 225 Goodwin Street, Springfield, MA

| Monitoring Well | Reference Elevation (Feet) | Depth to Water (ft) | | GW Elev. (ft) |
|-----------------|----------------------------|---------------------|--------|---------------|
| | | Sep-00 | Jun-03 | |
| OTO-1 | 100.0 | 16.6 | 16.7 | 83.3 |
| OTO-2 | 101.3 | 16.5 | 16.6 | 84.8 |
| OTO-3 | 103.2 | 16.0 | NA | 87.2 |
| OTO-4 | 99.6 | 12.1 | 12.1 | 87.5 |
| OTO-5 | 104.3 | 9.2 | 16.0 | 95.1 |
| OTO-6 | 101.5 | 11.9 | NA | 89.6 |
| OTO-7 | 99.7 | 13.7 | NA | 86.0 |
| OTO-8 | 96.7 | 9.5 | NA | 87.2 |
| CEA-1 | 99.3 | 14.4 | NA | 84.9 |
| CEA-2 | 100.8 | 17.6 | 17.7 | 83.2 |
| CEA-3 | 102.8 | 18.9 | NA | 83.9 |
| CEA-4 | 100.2 | 15.5 | NA | 84.7 |
| CEA-5 | 100.8 | 13.6 | NA | 87.2 |
| OTO-17 | 97.9 | NI | 14.9 | 83.0 |

1. NI=Not yet installed. NA = Not accessible, not found, or found to be compromised.

Table 5
Soil EPCs and Comparison to Method 1 Standards
225 Goodwin Street, Springfield, MA

| S-1 | GW-2/3 | Standards | EPCs (Average) | | Date Collected: | |
|------|--------|--|----------------|--------|-----------------|--------|
| | | | EP-4 | EP-1 | 8/2/00 | 8/2/00 |
| | | | 12-15' | 12-15' | Depth (feet): | |
| | | | EP-4 | EP-1 | Boring No.: | |
| 0.1 | | 1,1 Dichloroethene | 0.11 | 0.11 | | |
| | | 1,2,4-Trimethylbenzene | 0.28 | 0.28 | | |
| | | 1,3,5-Trimethylbenzene | 0.17 | 0.17 | | |
| | | 4-Isopropyltoluene | 0.14 | 0.14 | | |
| | | Isopropylbenzene | 0.15 | 0.15 | | |
| 100 | | Methylene chloride | 0.17 | 0.17 | | |
| 100 | | Naphthalene | 0.80 | 0.80 | | |
| | | n-Propylbenzene | 0.49 | 0.49 | | |
| | | sec-Butylbenzene | 0.13 | 0.13 | | |
| | | tert-Butylbenzene | 0.06 | 0.06 | | |
| 100 | | C5-C8 Aliphatics | 18 | 18 | | |
| 1000 | | C9-C12 Aliphatics | 48 | 48 | | |
| 100 | | C9-C10 Aromatics | 110 | 110 | | |
| 500 | | Ethylbenzene | 0.41 | 0.41 | | |
| 500 | | m,p-Xylene | 1.2 | 1.2 | | |
| 100 | | Naphthalene | 1.03 | 1.03 | | |
| 500 | | o-Xylene | 0.36 | 0.36 | | |
| | | Extractable Petroleum Hydrocarbons (EPH) | <0.1 | <0.1 | | |
| 1000 | | C9-C18 Aliphatics | 470 | 590 | | |
| 2500 | | C19-C36 Aliphatics | 90 | 2100 | | |
| 800 | | C11-C22 Aromatics | 290 | 800 | | |
| 500 | | 2-Methylnaphthalene | <0.28 | 9.2 | | |
| 1000 | | Acenaphthene | 0.37 | 0.61 | | |
| 100 | | Acenaphthylene | <0.28 | 0.29 | | |
| 1000 | | Anthracene | <0.28 | 0.53 | | |
| 0.7 | | Benzo(a)anthracene | <0.28 | 1.6 | | |
| 0.7 | | Benzo(a)pyrene | <0.28 | 0.6 | | |
| 7 | | Chrysene | <0.28 | 0.59 | | |
| 1000 | | Fluorene | 0.51 | 0.85 | | |
| 100 | | Naphthalene | <0.28 | 2.9 | | |
| 100 | | Phenanthrene | 1 | 3.3 | | |
| 700 | | Pyrene | <0.28 | 0.73 | | |
| | | Polychlorinated Biphenyls (PCBs) | ND | ND | | |
| 2 | | Aroclor 1260 | ND | ND | | |
| | | Metals | | | | |
| 1000 | | Barium | 47 | 47 | | |
| 1000 | | Chromium | 10 | 10 | | |
| 300 | | Lead | 8 | 8 | | |
| 20 | | Mercury | ND | ND | | |

Notes:

1. Concentrations in mg/kg.
2. ND=Not detected. Only compounds detected in at least one sample are shown here. Refer to 1
3. "-." indicates not tested for this analyte. "<" indicates not detected; value is sample-specific quan
4. Standards are lower of MCP Method 1 S-1/GW-2 and S-1/GW-3 criteria.

Table 6
Remedial Action Alternatives

| Alternative Number | Description | Comments |
|--------------------|--|--|
| A-1 | <ul style="list-style-type: none"> • Removal of the Underground Storage Tanks • Excavation and off site recycling of impacted soils • Post excavation sampling and analyses | <ul style="list-style-type: none"> • Will remove remaining contributing source area contamination • Tank removal required by Fire Regulations. |
| A-2 | <ul style="list-style-type: none"> • Removal of the Underground Storage Tanks • Post removal sampling and analyses • Implementation of Activity and Use Limitations | <p>No improvement of site conditions.</p> |

Table 7
 Cost Estimate
 Alternative A-1

| Task | Estimated Cost Range | Assumptions |
|-------------------------------|----------------------|--|
| Tank Removal | \$60,000 | Removal of six tanks and liquid contents |
| Soil Excavation and Recycling | \$20,000 | Assumes the excavation and removal of 250 yards of impacted soil |
| Post Excavation Sampling | \$2,000 | Assumes six post excavation soil samples and three groundwater samples |
| Risk Characterization | \$2,000 | Assumes Stage 1 environmental and Method 1 risk characterization |
| Final Inspection Report/RAO | \$4,000 | |
| Estimated Total | | \$88,000 |

Table 8
 Cost Estimate
 Alternative A-2

| Task | Estimated Cost Range | Assumptions |
|-------------------------------|----------------------|--|
| Tank Removal | \$60,000 | Removal of six tanks and liquid contents |
| Soil Excavation and Recycling | \$4,000 | Assumes the excavation and removal of 50 yards of impacted soil |
| Post Excavation Sampling | \$2,000 | Assumes six post excavation soil samples and three groundwater samples |
| Risk Characterization | \$4,000 | Assumes Stage 1 environmental and Method 1 risk characterization |
| Final Inspection Report/RAO | \$6,000 | |
| Estimated Total | | \$76,000 |

APPENDIX A
BWSC-108 TRANSMITTAL FORM



Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup

COMPREHENSIVE RESPONSE ACTION TRANSMITTAL FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

Release Tracking Number 1 - 0616

BWSC-108

A. SITE LOCATION:

Site Name: (optional) Former Crane Steel Foundry

Street 225 Goodwin Street

City/Town: Springfield, MA

Location Aid: Indian Orchard

ZIP Code: 01151

Related Release Tracking Numbers that this Form Addresses:

Tier Classification: (check one of the following) Tier IA Tier IB Tier IC Tier II Not Tier Classified

If a Tier I Permit has been issued, state the Permit Number:

B. THIS FORM IS BEING USED TO: (check all that apply)

Submit a final Phase II Comprehensive Site Report and Completion Statement, pursuant to 310 CMR 40.0836

Submit a Phase III Remedial Action Plan and Completion Statement, pursuant to 310 CMR 40.0862

Submit a Phase IV Remedial Implementation Plan, pursuant to 310 CMR 40.0874 (complete Sections A, B, C, G, H, I and J).

Submit an As-Built Construction Report, pursuant to 310 CMR 40.0875 (complete Sections A, B, C, G, H, I and J).

Submit a Phase IV Final Inspection Report and Completion Statement, pursuant to 310 CMR 40.0878 and 40.0879

Submit a periodic Phase V Inspection & Monitoring Report, pursuant to 310 CMR 40.0892 (complete Sections A, B, C, G, H, I and J).

Submit a final Phase V Inspection & Monitoring Report and Completion Statement, pursuant to 310 CMR 40.0893

You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.

C. RESPONSE ACTIONS:

Check here if any response action(s) that serves as the basis for the Phase submittal(s) involves the use of innovative Technologies. (DEP is interested in using this information to create an innovative Technologies Clearinghouse.)

Describe Technologies:

D. PHASE II COMPLETION STATEMENT:

Specify the outcome of the Phase II Comprehensive Site Assessment

Additional Comprehensive Response Actions are necessary at this Site, based on the results of the Phase II Comprehensive Site Assessment

The requirements of a Class A Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

The requirements of a Class B Response Action Outcome have been met and a completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

Resourcing of this Site using the Numerical Ranking System is necessary, based on the results of the final Phase II Report.

E. PHASE IV COMPLETION STATEMENT:

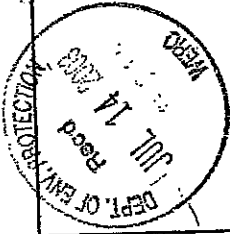
Specify the outcome of Phase IV activities:

Phase V operation, maintenance or monitoring of the Comprehensive Response Action is necessary to achieve a Response Action Outcome. (This site will be subject to a Phase V Operation, Maintenance and Monitoring Annual Compliance Fee.)

The requirements of a Class A Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

The requirements of a Class C Response Action Outcome have been met. No additional operation, maintenance or monitoring is necessary to ensure the integrity of the Response Action Outcome. A completed Response Action Outcome Statement (BWSC-104) will be submitted to DEP.

SECTION E IS CONTINUED ON THE NEXT PAGE



Handwritten signature



Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

COMPREHENSIVE RESPONSE ACTION TRANSMITTAL

FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

Release Tracking Number

1 - 0616

H. PERSON UNDERTAKING RESPONSE ACTION(S):

Name of Organization: City of Springfield
 Name of Contact: Katie Galluzzo
 Title: Planning Dept.
 Street: 36 Court Street, City Hall
 City/Town: Springfield
 State: MA
 ZIP Code: 01103
 Telephone: 413-787-6525
 Ext.:
 FAX: (optional)
 Check here if there has been a change in the person undertaking the Response Action.

I. RELATIONSHIP TO SITE OF PERSON UNDERTAKING RESPONSE ACTION(S): (check one)

RP or PRP
 Owner
 Operator
 Generator
 Transporter
 Other RP or PRP
 Fiduciary, Secured Lender or Municipally with Exempt Status (as defined by M.G.L. c. 21E, s. 2)
 Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(1))
 Any Other Person Undertaking Response Action Specify Relationship: _____

J. CERTIFICATION OF PERSON UNDERTAKING RESPONSE ACTION(S):

I, Thomas Mc Colgan, attest under the pains and penalties of perjury (1) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. If the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: Thomas Mc Colgan (signature)
 For: City of Springfield (print name of person or entity recorded in Section H)
 Date: 6/25/03
 Enter address of the person providing certification, if different from address recorded in Section H:
 Street:
 City/Town:
 State:
 ZIP Code:

YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

APPENDIX B
BORING LOGS

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING EP-1

| | | | | | | | |
|----------------------------|--|--------------------------|--|-------------------------|--|-----------------------------|--|
| PROJECT NO. 176 22 01 | | DATE FINISHED 08/02/2000 | | DATE STARTED 08/02/2000 | | LOCATION 225 Goodwin Street | |
| GROUND SURFACE ELEV. DATUM | | COMPLETION DEPTH 17' | | NO. SAMPLES 6 | | DIST. | |
| PROJECT NO. | | DATE FINISHED | | DATE STARTED | | LOCATION | |
| PROJECT NO. 176 22 01 | | DATE FINISHED 08/02/2000 | | DATE STARTED 08/02/2000 | | LOCATION 225 Goodwin Street | |
| PROJECT NO. | | DATE FINISHED | | DATE STARTED | | LOCATION | |
| PROJECT NO. 176 22 01 | | DATE FINISHED 08/02/2000 | | DATE STARTED 08/02/2000 | | LOCATION 225 Goodwin Street | |
| PROJECT NO. | | DATE FINISHED | | DATE STARTED | | LOCATION | |
| PROJECT NO. 176 22 01 | | DATE FINISHED 08/02/2000 | | DATE STARTED 08/02/2000 | | LOCATION 225 Goodwin Street | |

| SAMPLES | DEPTH FT. | PENETR. RESIST. IN. | RECORD NO. | TYPE/NO. | DESCRIPTION | YIELD MEASUREMENTS | SOIL DESCRIPTION | REMARKS |
|-------------|-----------|---------------------|------------|----------|--|--------------------|--------------------------------------|---------|
| | | | | | | | | |
| S-1 (0-3) | 36" | | | S-1 | Top 3': Dark brown, LOAM Bottom 33': Light brown, fine to medium SAND, trace gravel | ND | Fine to medium SAND | |
| S-2 (3-6) | 30" | | | S-2 | Light brown, fine to medium SAND, moist, trace gravel | ND | Fine SAND | |
| S-3 (6-9) | 32" | | | S-3 | 1': Light brown, silty SAND, 1": light brown, very fine SAND, 6": Loose, light gray silty SAND, 2": light brown, fine SAND, 3": Light gray, clayey SAND, wet, 18": Orange mottles, light brown, fine SAND with silt and clay, wet, 1": Orange-tint fine to medium SAND | ND | Fine SAND + silt | |
| S-4 (9-12) | 36" | | | S-4 | Top 24": Light brown, silty SAND with some clay, wet Bottom 12": Light brown, fine to coarse SAND and GRAVEL, moist slight odor | ND | SAND + GRAVEL | |
| S-5 (12-15) | 30" | | | S-5 | Top 20": Light brown, fine to medium SAND, orange mottles 2": Orange, fine to coarse SAND and GRAVEL with some cobbles, moist 6": Dark brown, fine to coarse SAND, grave with some silt and cobbles, petroleum odor | ND | Fine to medium SAND SAND + GRAVEL | |
| S-6 (15-18) | 18" | | | S-6 | Dark brown fine to coarse sand, gravel with some silt and cobbles, slight odor, moist | ND | SAND + GRAVEL | |

Remarks: Samples screened in field using TSI Model 580B referenced to Ppm of Benzene in air. "ND" indicates none detected.

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING EP-3

| | | | | | | | | | | | |
|--|--|--------------------------------|--|-------------------------|--|------------------|--|----------------------|--|-----------|--|
| PROJECT NO. 1076 22 01 | | DATE FINISHED 08/02/2000 | | DATE STARTED 08/02/2000 | | COMPLETION DEPTH | | GROUND SURFACE ELEV. | | DATUM | |
| UNDIST. | | FIRST | | COMPL. | | HR. | | TIME | | DIST. | |
| No. Sample 6 | | BORING | | WATER LEVEL (FT.) | | DROPPED | | WEIGHT | | DROPPED | |
| LOCATION | | ENGINEER/GEOLOGIST | | LOCATION | | DROPPED | | WEIGHT | | DROPPED | |
| Indian Orchard Brownfields, Goodwin Street | | Jim Gagnon | | West of tanks, near III | | DROPPED | | WEIGHT | | DROPPED | |
| OBJECT | | CONTRACTOR | | EQUIPMENT | | EQUIPMENT | | EQUIPMENT | | EQUIPMENT | |
| Foreman | | Scaford Environmental Drilling | | Pathprobe | | Pathprobe | | Pathprobe | | Pathprobe | |

| SAMPLES | DEPTH FT. | PENETR. RESIST. IN. | RECORD. IN. | TYPE/NO. | DESCRIPTION | FIELD MEASUREMENTS | SOIL DESCRIPTION | REMARKS |
|---------|-----------|---------------------|-------------|---|---|--------------------|--|---------|
| | | | | | | | | |
| S-1 | 0-3 | 36" | 36" | Top 4": Dark Brown LOAM | Bottom 10": Brown, fine to medium SAND with some cobbles | ND | Fine to medium SAND | |
| S-2 | 3-6 | 36" | 36" | Top 18": Light brown, fine to medium silty SAND | Bottom 12": Light gray, fine silty SAND, wet, orange mottles | ND | Silt + SAND | |
| S-3 | 6-9 | 36" | 36" | 1": Light gray, silty, fine SAND | Middle 16": Light brown, fine SAND with light gray silt, wet | ND | Fine to medium SAND | |
| S-4 | 9-12 | 30" | 30" | Top 6": Light brown, fine to medium silty SAND with some gray clay, orange mottles, wet | Bottom 24": Light brown/orange fine to coarse SAND, trace gravel, moist | ND | Fine to coarse SAND | |
| S-5 | 12-15 | 36" | 36" | Light brown, fine to coarse SAND with trace gravel | | ND | Fine to coarse SAND | |
| S-6 | 15-17.5 | 30" | 30" | Top 12": Light brown, fine to medium SAND | Bottom 18": Light brown, fine to coarse SAND, trace gravel, wet | ND | Fine to medium SAND Fine to coarse SAND | |

Samples screened in acid using TEI Model 580B referenced to Ppm of Benzene in air. "ND" indicates none detected.

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.
 ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING EP-5

| | | |
|----------------------------|--|------------------|
| PROJECT | Indian Orchard Brownfields, Goodwin Street | |
| DRILLING CONTRACTOR | Seaboard Environmental Drilling | FOREMAN Jason |
| DRILLING EQUIPMENT | Earthprobe | |
| TYPE BIT | Earthprobe | |
| SIZE & TYPE OF CORE BARREL | DROP | |
| WEIGHT | DROPT | |
| WATER LEVEL (FT.) | DROPT | |
| TIME | No. Sample 2 | |
| FIRST | DIST. | |
| COMPL. HR. | UNDIST. | |
| DATE FINISHED | 08/02/2008 | |
| DATE STARTED | 08/02/2008 | |
| COMPLETION DEPTH | 6 | |
| GROUND SURFACE ELEV. | DATUM | |
| LOCATION | 275 Goodwin Street | |
| PROJECT NO. | 1076 22 01 | |

| DEPTH FT. | PENETR. RESIST. Bl/6 IN. | REC. IN. | SAMPLER | SAMPLER TYPE/NO. | DESCRIPTION | FIELD MEASUREMENTS | SOIL DESCRIPTION | REMARKS |
|-----------|--------------------------|----------|---------|------------------|---|--------------------|---------------------|---------|
| | | | | | | | | |
| 0 | | | | S-1 (0'-3") | 1. Loose, brown, fine to coarse SAND | ND | Fine to coarse SAND | |
| 3 | | | | S-1 (0'-3") | 2. Dark ASH | | | |
| 4 | | | | S-1 (0'-3") | 3. Light brown-brown, fine to coarse SAND, trace gravel | | | |
| 5 | | | | S-1 (0'-3") | 4. Light brown, fine to coarse SAND, trace gravel | | | |
| 6 | | | | S-2 (3'-6") | 5. Light brown, fine to coarse SAND, trace gravel | | | |
| 7 | | | | S-2 (3'-6") | 6. Light brown, fine to coarse SAND, trace gravel | | | |
| 8 | | | | S-2 (3'-6") | 7. Light brown, fine to coarse SAND, trace gravel | | | |
| 9 | | | | S-2 (3'-6") | 8. Light brown, fine to coarse SAND, trace gravel | | | |
| 10 | | | | | | | | |
| 15 | | | | | | | | |
| 20 | | | | | | | | |
| 25 | | | | | | | | |

marks: Samples screened in field using TEL Model 580B referred to PPM of Benzene in air. "ND" indicates none detected.

O'REILLY, TALBOT & OKUN ASSOCIATES, INC.
 ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING OTO-3

| | | |
|----------------------------|--|----------------------|
| PROJECT | Indian Orchard Brownfields, Goodwin Street | |
| DRILLING CONTRACTOR | FORAMAN | Frank/Justin |
| DRILLING EQUIPMENT | Seaboard Environmental Drilling | |
| TYPE BIT | B-53 Hollow Stem Auger | |
| SIZE & TYPE OF CORE BARREL | No. Sample 5 | |
| DATE STARTED | 08/03/00 | COMPLETION DEPTH |
| DATE FINISHED | 08/04/00 | GROUND SURFACE ELEV. |
| PROJECT NO. | J76 18 01 | DATUM |
| LOCATION | 225 Goodwin St. | UNDIST. |
| LOCATION | West side of building, near former gasoline tank | |
| BORING | ENGINEER/GEOLOGIST | |
| WATER LEVEL (FT.) | 10' | |
| TIME | FIRST | COMPL. |
| WEIGHT | 30" | |
| SAMPLER | Split Spoon | |
| SAMPLER | HOLLOW STEM AUGER | |
| WEIGHT | 140 | |
| WEIGHT | 30" | |

| DEPTH FT. | SAMPLES | PENETR. RESIST. BL/IN. | RECORD IN. | TYPE/ NO. | DESCRIPTION | FIELD MEASUREMENTS | SOIL DESCRIPTION | REMARKS |
|--------------|---------|------------------------------|---------------|----------------|--|-----------------------|---------------------|---------|
| | | | | | | | | |
| 39/10/10 | | 12/24 | 12/24 | S-1 (0-2) | Top 6": Dark brown, top soil, fine to coarse SAND, rocks, some coal Bottom 6": Orange | ND | Fine to coarse SAND | |
| 15/10/13 | | 12/24 | 12/24 | S-2 (5-7) | Light brown, fine to coarse SAND, trace gravel | ND | | |
| 25/16/17/22 | | 14/24 | 14/24 | S-3 (10-12) | Light brown, fine to coarse SAND, trace gravel | ND | | |
| 7/10/12/14 | | 18/24 | 18/24 | S-4 (15-17) | Light brown, fine to coarse SAND with some gravel, wet | ND | | |
| 10/24 | | 10/24 | 10/24 | S-5 (20-22) | Top 2": Light brown, fine to medium SAND Bottom 8": Red-brown, silty, fine to coarse SAND, trace gravel, some clay, wet | ND | SAND and clay | |

Remarks:
 1. Samples screened in field using FID referenced to PPM of benzene in air. Readings in meter units. "ND" indicates none detected.
 2. Well set at 22; PVC riser (22-12) PVC riser (12-ground surface). Bentonite (10-8), Sand (22-10' and 8'-ground surface)

O'REILLY, TALBOT & OXUN ASSOCIATES, INC.
 ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING CONSULTANTS

LOG OF BORING OTO-17

PROJECT Indian Orchard Brownfields, Goodwin Street
 TILLING CONTRACTOR Seaboard Environmental Drilling
 TILLING EQUIPMENT Rob Ingram
 H-53 Scabard Environmental Drilling

TYPE BIT Hollow Stem Auger
 SIZE & TYPE OF CORE BARREL
 No. Sample 5
 DIST. 22'

DATE STARTED 12/16/02
 DATE FINISHED 12/16/02
 GROUND SURFACE ELEV. DATUM

COMPLETION DEPTH
 TIME
 WATER LEVEL (FT.)
 BORING

ENGINEER/ GEOLOGIST
 LOCATION
 LOCATION
 ENGINEER/ GEOLOGIST

SAMPLER Split Spoon
 WEIGHT 140
 DROP 30"

SAMPLER
 SING HAMM
 SING

DEPTH FT.
 PENETR. RESIST. BL/IN.
 REC. IN.
 TYPE/ NO.

DESCRIPTION
 FIELD MEASUREMENTS
 SOIL DESCRIPTION
 REMARKS

4/9/14 6/24 S-1 Brown, fine to coarse SAND and GRAVEL
 6/6/14 8/24 S-2 Brown, fine to medium SAND, trace silt
 3/23/50/46 12/24 S-3 Brownish red, fine SAND, some silt, little gravel
 6/10/23/32 12/24 S-4 Brown, fine to medium SAND, trace silt
 6/9/18/24 12/24 S-5 Brown, fine to coarse SAND and GRAVEL, trace silt

ND ND ND ND ND
 ND ND ND ND ND
 ND ND ND ND ND

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

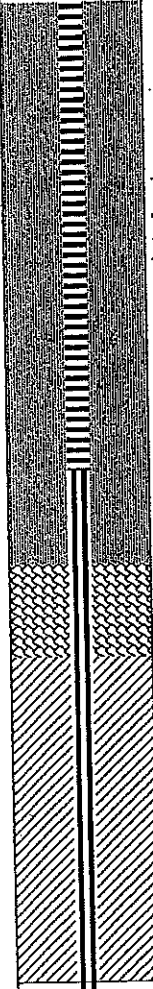
4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

4/9/14 6/24 S-1
 6/6/14 8/24 S-2
 3/23/50/46 12/24 S-3
 6/10/23/32 12/24 S-4
 6/9/18/24 12/24 S-5

Remarks
 1. Samples screened in field using FID referenced to PPM of benzene in air. Readings in meter units. "ND" indicates none detected
 2. Well set at 21', PVC filter (11'-2.5' ground surface), Bentonite (9'-7'), Sand (21'-9'), Cuttings (7'-ground surface)



APPENDIX C
LABORATORY REPORTS



February 28, 2003

Valerie Watanabe
O'Reilly, Talbot & Okun
293 Bridge Street
Suite 500
Springfield, MA 01103

TEL: (413) 788-6222
FAX: (413) 788-8830

RE: 076-22-01 Crane

Dear Valerie Watanabe:
AMRO Environmental Laboratories Corp. received 5 samples on 2/10/03 for the analyses presented in the following report.

AMRO operates a Quality Assurance Program which meets or exceeds National Environmental Laboratory Accreditation Conference (NELAC), state, and EPA requirements. A copy of the appropriate state and/or NELAC Certificate is attached.

The enclosed Sample Receipt Checklist details the condition of your sample(s) upon receipt. Please be advised that any unused sample volume and sample extracts will be stored for a period of 60 days from sample receipt date (90 days for samples from New York). After this time, AMRO will properly dispose of the remaining sample(s). If you require further analysis, or need the samples held for a longer period, please contact us immediately.

This report consists of a total of 30 pages. This letter is an integral part of your data report. All results in this project relate only to the sample(s) as received by the laboratory and documented in the Chain-of-Custody. This report shall not be reproduced except in full, without the written approval of the laboratory. If you have any questions regarding this project in the future, please refer to the Workorder Number above.

Sincerely,

Nancy Stewart
Vice President/Lab Director

Workorder No.: 0302064

AMRO Environmental Laboratories Corp.

19-Feb-03

DATES REPORT

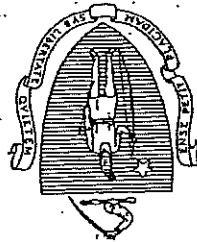
Lab Order: 0302064

Client: O'Reilly, Talbot & Okun

Project: 076-22-01 Crane

| Sample ID | Client Sample ID | Collection Date | Matrix | Test Name | TCIR Date | Prep Date | Analysis Date | Batch ID |
|-------------|------------------|-----------------|-------------|--------------------------------|-----------|-----------|---------------|----------|
| 0302064-01A | Equip Blank | 2/10/03 | Aqueous | Volatle Petroleum Hydrocarbons | 2/12/03 | 2/12/03 | 2/12/03 | R17513 |
| 0302064-01B | | | | EPH, Water, Full List | 2/17/03 | 2/17/03 | 2/17/03 | 8560 |
| 0302064-02A | CEA-2 | | Groundwater | Volatle Petroleum Hydrocarbons | 2/12/03 | 2/12/03 | 2/12/03 | R17513 |
| 0302064-02B | | | | EPH, Water, Full List | 2/17/03 | 2/17/03 | 2/17/03 | 8560 |
| 0302064-03A | CEA-2D | | | Volatle Petroleum Hydrocarbons | 2/12/03 | 2/12/03 | 2/12/03 | R17513 |
| 0302064-03B | | | | EPH, Water, Full List | 2/17/03 | 2/17/03 | 2/17/03 | 8560 |
| 0302064-04A | OTO-17 | | | Volatle Petroleum Hydrocarbons | 2/12/03 | 2/12/03 | 2/12/03 | R17513 |
| 0302064-04B | | | | EPH, Water, Full List | 2/17/03 | 2/17/03 | 2/17/03 | 8560 |
| 0302064-05A | TRIP BLANK | | Aqueous | Volatle Petroleum Hydrocarbons | 2/12/03 | 2/12/03 | 2/12/03 | R17513 |

The Commonwealth of Massachusetts



Department of Environmental Protection
Division of Environmental Analysis
Senator William X. Wall Experiment Station

certifies

M-NH012

AMRO ENVIRONMENTAL LAB
111 HERRICK ST
MERRIMACK, NH 03054-0000

Laboratory Director: Nancy Stewart

for the analysis of NON POTABLE WATER (CHEMISTRY)

POTABLE WATER (CHEMISTRY)

pursuant to 310 CMR 42.00

This certificate supersedes all previous Massachusetts certificates issued to this laboratory. The laboratory is regulated by and shall be responsible for being in compliance with Massachusetts regulations at 310 CMR 42.00.

This certificate is valid only when accompanied by the latest dated Certified Parameter List as issued by the Massachusetts D.E.P. Contact the Division of Environmental Analysis to verify the current certification status of the laboratory.

Certification is no guarantee of the validity of the data. This certification is subject to unannounced laboratory inspections.

Debra O. Barock

Director, Division of Environmental Analysis

Expires: 30 JUN 2003

Issued: 01 JUL 2002

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Certified Parameter List as of: 09 FEB 2003

AMRO ENVIRONMENTAL LAB
MERRIMACK NH

M-NH012 POTABLE WATER (CHEMISTRY) Effective Date 09 FEB 2003 Expiration Date 30 JUN 2003

Analytes and Methods

| | |
|-----------------------------|----------------|
| ANTIMONY | EPA 200.9 |
| ARSENIC | EPA 200.7 |
| ARSENIC | EPA 200.9 |
| BARIUM | EPA 200.7 |
| BERYLLIUM | EPA 200.7 |
| CADMIUM | EPA 200.7 |
| CHROMIUM | EPA 200.7 |
| COPPER | EPA 200.7 |
| LEAD | EPA 200.9 |
| MERCURY | EPA 245.1 |
| NICKEL | EPA 200.7 |
| SELENIUM | EPA 200.9 |
| THALLIUM | EPA 200.9 |
| NITRATE-N | EPA 353.2 |
| NITRITE-N | EPA 353.2 |
| FLUORIDE | EPA 300.0 |
| SODIUM | EPA 200.7 |
| SULFATE | EPA 300.0 |
| CYANIDE | SM 4500-CN-C,E |
| TURBIDITY | EPA 180.1 |
| TOTAL ALKALINITY | SM 2320B |
| TOTAL DISSOLVED SOLIDS | SM 2540C |
| PH | EPA 150.1 |
| 1,2-DIBROMOETHANE | EPA 504.1 |
| 1,2-DIBROMO-3-CHLOROPROPANE | EPA 504.1 |

Volatile Petroleum Hydrocarbons (VPH)
Massachusetts Department of Environmental Protection (MADEP)
Method 1.0 - January 1998
AMRO Modifications

This modification is based on the use of a purge and trap gas chromatography mass spectrometer (GC/MS) system to analyze samples for VPH. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates potential false positives for the target analytes while providing accurate hydrocarbon range data.

The chromatographic column is an HP-624 capillary column which has been validated by GC/MS analysis of a gasoline standard to correctly identify the marker compounds and elution order of specific gasoline components. Batch quality control includes, at a minimum, method blank, laboratory control sample, and duplicate analysis. A matrix spike and/or matrix spike duplicate is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 0.6-2.5 mg/kg in soil and 25-100 µg/L in water. The RL of this method for the target analytes ranges from approximately 0.05-0.12 mg/kg in soil and 2.0-5.0 µg/L for water samples.

Extractable Petroleum Hydrocarbons (EPH)
Massachusetts Department of Environmental Protection (MADEP)
Method 1.0 - January 1998
AMRO Modifications

This modification is based on a solvent extraction and gas chromatography mass spectrometer (GC/MS) analysis. The hydrocarbon ranges are quantified using predominant mass fragmentation ions which are characteristic for the range being measured. This approach eliminates the silica gel solid-phase fractionation step. False positives for targeted PAH analytes are eliminated by using GC/MS as the primary analysis technique.

The chromatographic column is a J&W Scientific DB-5ms capillary column. Internal standard calibration is performed using 5 α -Androstane at a concentration of 20 ng/µL. o-Terphenyl and 1-Chlorooctadecane are added as surrogate compounds at 20 ng/µL in the sample extract. These two surrogates monitor the effects of the sample matrix and extraction efficiency. Two additional surrogates, 2-Fluorobiphenyl and 2-Bromonaphthalene, are added to the finished extract prior to analysis to monitor instrument performance. Batch quality control includes, at a minimum, a procedure blank, laboratory control sample and duplicate sample analysis. A matrix spike is analyzed if sufficient sample is submitted to the laboratory.

The Reporting Limit (RL) of this method for each of the collective aliphatic and aromatic ranges is approximately 50 mg/kg in soil and 100 µg/L in water. The RL of this method for the Target PAH analytes is approximately 0.25 mg/kg in soil, 1.0 µg/L for water when operating the GC/MS in full scan mode, and 0.1 µg/L when operating the GC/MS in SIM mode. For sites requiring the lowest levels cited in the Massachusetts Contingency Plan for water, GC/MS in the Selected Ion Monitoring (SIM) mode is used.

| | |
|--------------------------|-------------------------|
| CLIENT: | O'Reilly, Talbot & Okun |
| Lab Order: | 0302064 |
| Project: | 076-22-01 Crane |
| Lab ID: | 0302064-02A |
| Client Sample ID: CBA-2 | |
| Tag Number: | |
| Collection Date: 2/10/03 | |
| Matrix: GROUNDWATER | |

| Analyses | Result | RL | Qual Units | DF | Date Analyzed |
|----------|--------|----|------------|----|---------------|
|----------|--------|----|------------|----|---------------|

Analyst: NM

| Analyses | Result | RL | Qual Units | DF | Date Analyzed |
|-------------------------------|--------|--------|------------|----|--------------------|
| C5-C8 Aliphatic Hydrocarbons | ND | 100 | µg/L | 1 | 2/12/03 4:12:00 PM |
| C9-C12 Aliphatic Hydrocarbons | ND | 25 | µg/L | 1 | 2/12/03 4:12:00 PM |
| C9-C10 Aromatic Hydrocarbons | ND | 2.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| Methyl tert-butyl ether | ND | 2.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| Benzene | ND | 2.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| Toluene | ND | 2.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| Ethylbenzene | ND | 2.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| m,p-Xylene | ND | 2.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| o-Xylene | ND | 2.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| Naphthalene | ND | 5.0 | µg/L | 1 | 2/12/03 4:12:00 PM |
| Surr. 1,2-Dichloroethane-d4 | 114 | 70-130 | %REC | 1 | 2/12/03 4:12:00 PM |
| Surr. 2,5-Dibromotoluene | 132 | 70-130 | %REC | 1 | 2/12/03 4:12:00 PM |
| Surr. 4-Bromofluorobenzene | 104 | 70-130 | %REC | 1 | 2/12/03 4:12:00 PM |
| Surr. Dibromofluoromethane | 109 | 70-130 | %REC | 1 | 2/12/03 4:12:00 PM |
| Surr. Toluene-d8 | 107 | 70-130 | %REC | 1 | 2/12/03 4:12:00 PM |

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range. C9-C12 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Yes No - If No, See Case Narrative
 Were all performance/acceptance standards for required QA/QC procedures achieved: Yes No - If No, See Case Narrative
 Were any significant modifications made to the method as specified in section 11.3: No Yes - Details enclosed

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

SIGNATURE: 
 PRINTED NAME: Nancy Stewart
 POSITION: Laboratory Director (or designee)
 DATE: 02/28/03

Qualifiers: RL - Reporting Limit defined as the lowest concentration the laboratory can accurately quantitate.
 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Value above quantitation range
 # - See Case Narrative
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 H - Method prescribed holding time exceeded
 B - Analyte detected in the associated Method Blank

AMRO Environmental Laboratories Corp.

Date: 19-Feb-03

| | |
|----------------------|-------------------------|
| CLIENT: | O'Reilly, Talbot & Okun |
| Lab Order: | 0302064 |
| Project: | 076-22-01 Crane |
| Lab ID: | 0302064-04A |
| Analyses | |
| Result | RL Qual Units |
| Date Analyzed | DF |
| Analyst: NM | |

VOLATILE PETROLEUM HYDROCARBONS

| Compound | Concentration (µg/L) | RL (µg/L) | Qual | Units | %REC | Date |
|-------------------------------|----------------------|-----------|------|-------|------|--------------------|
| C5-C8 Aliphatic Hydrocarbons | ND | 100 | | µg/L | | 2/12/03 5:55:00 PM |
| C9-C12 Aliphatic Hydrocarbons | ND | 25 | | µg/L | | 2/12/03 5:55:00 PM |
| C9-C10 Aromatic Hydrocarbons | ND | 25 | | µg/L | | 2/12/03 5:55:00 PM |
| Methyl tert-butyl ether | ND | 2.0 | | µg/L | | 2/12/03 5:55:00 PM |
| Benzene | ND | 2.0 | | µg/L | | 2/12/03 5:55:00 PM |
| Toluene | ND | 2.0 | | µg/L | | 2/12/03 5:55:00 PM |
| Ethylbenzene | ND | 2.0 | | µg/L | | 2/12/03 5:55:00 PM |
| m,p-Xylene | ND | 2.0 | | µg/L | | 2/12/03 5:55:00 PM |
| o-Xylene | ND | 2.0 | | µg/L | | 2/12/03 5:55:00 PM |
| Naphthalene | ND | 5.0 | | µg/L | | 2/12/03 5:55:00 PM |
| Surr: 1,2-Dichloroethane-d4 | 111 | 70-130 | | %REC | | 2/12/03 5:55:00 PM |
| Surr: 2,5-Dibromotoluene | 104 | 70-130 | | %REC | | 2/12/03 5:55:00 PM |
| Surr: 4-Bromofluorobenzene | 97.1 | 70-130 | | %REC | | 2/12/03 5:55:00 PM |
| Surr: Dibromofluoromethane | 117 | 70-130 | | %REC | | 2/12/03 5:55:00 PM |
| Surr: Toluene-d8 | 107 | 70-130 | | %REC | | 2/12/03 5:55:00 PM |

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Yes No - If No, See Case Narrative
 Were all performance/acceptance standards for required QA/QC procedures achieved: Yes No - If No, See Case Narrative
 Were any significant modifications made to the method as specified in section 11.3: Yes No - Details enclosed

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

SIGNATURE: 
PRINTED NAME: Nancy Stewart
DATE: 02/19/03
POSITION: Laboratory Director (or designee)

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantify.
 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 B - Value above quantitation range
 # - See Case Narrative
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 H - Method prescribed holding time exceeded
 B - Analyte detected in the associated Method Blank

AMRO Environmental Laboratories Corp.

Date: 25-Feb-03

QC SUMMARY REPORT

Method Blank

CLIENT: O'Reilly, Talbot & Okun
 Work Order: 0302064
 Project: 076-22-01 Crane

Sample ID mb 0212/03 Batch ID: R17513 Test Code: MAVPH Units: µg/L Analysis Date 2/12/03 1:54:00 PM Prep Date 2/12/03
 Run ID: V-4_030212A
 SeqNo: 279968

| Analyte | QC Sample Result | RL | Units | QC Spike | | Original Sample | | %RPD | RPDLimit | Qua |
|-------------------------------|------------------|-----|-------|----------|--------|-----------------|----------|------|----------|-----|
| | | | | Amount | Result | %REC | LowLimit | | | |
| C5-C8 Aliphatic Hydrocarbons | ND | 100 | µg/L | | | | | | | |
| C9-C12 Aliphatic Hydrocarbons | ND | 25 | µg/L | | | | | | | |
| C9-C10 Aromatic Hydrocarbons | ND | 25 | µg/L | | | | | | | |
| Methyl tert-butyl ether | ND | 2.0 | µg/L | | | | | | | |
| Benzene | ND | 2.0 | µg/L | | | | | | | |
| Toluene | ND | 2.0 | µg/L | | | | | | | |
| Ethylbenzene | ND | 2.0 | µg/L | | | | | | | |
| m,p-Xylene | ND | 2.0 | µg/L | | | | | | | |
| o-Xylene | ND | 2.0 | µg/L | | | | | | | |
| Naphthalene | ND | 5.0 | µg/L | | | | | | | |
| Surr: 1,2-Dichloroethane-d4 | 27.35 | 0 | µg/L | 25 | 0 | 109 | 70 | 130 | 0 | |
| Surr: 2,5-Dibromotoluene | 22.97 | 0 | µg/L | 25 | 0 | 91.9 | 70 | 130 | 0 | |
| Surr: 4-Bromofluorobenzene | 24.52 | 0 | µg/L | 25 | 0 | 98.1 | 70 | 130 | 0 | |
| Surr: Dibromofluoromethane | 24.69 | 0 | µg/L | 25 | 0 | 98.8 | 70 | 130 | 0 | |
| Surr: Toluene-d8 | 26.15 | 0 | µg/L | 25 | 0 | 105 | 70 | 130 | 0 | |

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits NA - Not applicable where J values or NID results occur
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: 25-Feb-03

QC SUMMARY REPORT

Sample Matrix Spike

CLIENT: O'Reilly, Talbot & Okun
 Work Order: 0302064
 Project: 076-22-01 Crane

Sample ID 0302064-04Ams Batch ID: R17513 Test Code: MAVPH Units: µg/L Analysis Date 2/12/03 6:28:00 PM Prep Date 2/12/03
 Client ID: OTO-17 Run ID: V4_030212A SeqNo: 279976

| Analyte | QC Sample Result | RL | Units | QC Spike Amount | | Original Sample Result | %REC | LowLimit | HighLimit | Original Sample | | %RPD | RPDLimit | Qua |
|-----------------------------|------------------|-----|-------|-----------------|------|------------------------|------|----------|-----------|-----------------|----------|------|----------|-----|
| | | | | Amount | µg/L | | | | | or MS Result | RPDLimit | | | |
| Methyl tert-butyl ether | 21.31 | 2.0 | µg/L | 20 | 20 | 0 | 107 | 70 | 130 | 0 | 0 | | | |
| Benzene | 23.87 | 2.0 | µg/L | 20 | 20 | 0 | 119 | 70 | 130 | 0 | 0 | | | |
| Toluene | 24.79 | 2.0 | µg/L | 20 | 20 | 0 | 124 | 70 | 130 | 0 | 0 | | | |
| Ethylbenzene | 21.43 | 2.0 | µg/L | 20 | 20 | 0 | 107 | 70 | 130 | 0 | 0 | | | |
| m,p-Xylene | 42.91 | 2.0 | µg/L | 40 | 40 | 0 | 107 | 70 | 130 | 0 | 0 | | | |
| o-Xylene | 20.37 | 2.0 | µg/L | 20 | 20 | 0 | 102 | 70 | 130 | 0 | 0 | | | |
| Naphthalene | 15.79 | 5.0 | µg/L | 20 | 20 | 0 | 79 | 70 | 130 | 0 | 0 | | | |
| Surr: 1,2-Dichloroethane-d4 | 30.18 | 0 | µg/L | 25 | 25 | 0 | 121 | 70 | 130 | 0 | 0 | | | |
| Surr: 2,5-Dibromotoluene | 28.89 | 0 | µg/L | 25 | 25 | 0 | 116 | 70 | 130 | 0 | 0 | | | |
| Surr: 4-Bromofluorobenzene | 26.18 | 0 | µg/L | 25 | 25 | 0 | 105 | 70 | 130 | 0 | 0 | | | |
| Surr: Dibromofluoromethane | 27.89 | 0 | µg/L | 25 | 25 | 0 | 112 | 70 | 130 | 0 | 0 | | | |
| Surr: Toluene-d8 | 28.94 | 0 | µg/L | 25 | 25 | 0 | 116 | 70 | 130 | 0 | 0 | | | |

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
 J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits NA - Not applicable where J values or ND results occur
 RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: 25-Feb-03

QC SUMMARY REPORT

Laboratory Control Spike

CLIENT: O'Reilly, Talbot & Okun
 Work Order: 0302064
 Project: 076-22-01 Crane

Sample ID: los 02/12/03 Batch ID: R17513 Test Code: MAVPH Units: µg/L Analysis Date: 2/12/03 12:16:00 PM Prep Date: 2/12/03
 Run ID: V-4_030212A SeqNo: 279967

| Analyte | QC Sample Result | RL | Units | QC Spike Original Sample | | Result | %REC | LowLimit | HighLimit | Original Sample | | %RPPD | RPPDLimit | Qua |
|-----------------------------|------------------|-----|-------|--------------------------|--------|--------|------|----------|-----------|-----------------|-----------|-------|-----------|-----|
| | | | | Amount | Result | | | | | or MS Result | RPPDLimit | | | |
| Methyl tert-butyl ether | 19.61 | 2.0 | µg/L | 20 | 0 | 0 | 98 | 70 | 130 | 0 | 0 | | | |
| Benzene | 22.01 | 2.0 | µg/L | 20 | 0 | 0 | 110 | 70 | 130 | 0 | 0 | | | |
| Toluene | 22.2 | 2.0 | µg/L | 20 | 0 | 0 | 111 | 70 | 130 | 0 | 0 | | | |
| Ethylbenzene | 20.08 | 2.0 | µg/L | 20 | 0 | 0 | 100 | 70 | 130 | 0 | 0 | | | |
| m,p-Xylene | 40.64 | 2.0 | µg/L | 40 | 0 | 0 | 102 | 70 | 130 | 0 | 0 | | | |
| o-Xylene | 20.16 | 2.0 | µg/L | 20 | 0 | 0 | 101 | 70 | 130 | 0 | 0 | | | |
| Naphthalene | 16.31 | 5.0 | µg/L | 20 | 0 | 0 | 81.6 | 70 | 130 | 0 | 0 | | | |
| Surr: 1,2-Dichloroethane-d4 | 26.57 | 0 | µg/L | 25 | 0 | 0 | 106 | 70 | 130 | 0 | 0 | | | |
| Surr: 2,5-Dibromotoluene | 26.2 | 0 | µg/L | 25 | 0 | 0 | 105 | 70 | 130 | 0 | 0 | | | |
| Surr: 4-Bromofluorobenzene | 26.88 | 0 | µg/L | 25 | 0 | 0 | 108 | 70 | 130 | 0 | 0 | | | |
| Surr: Dibromofluoromethane | 26.83 | 0 | µg/L | 25 | 0 | 0 | 107 | 70 | 130 | 0 | 0 | | | |
| Surr: Toluene-d8 | 27.44 | 0 | µg/L | 25 | 0 | 0 | 110 | 70 | 130 | 0 | 0 | | | |

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits NA - Not applicable where J values or ND results occur

RL - Reporting Limit, defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: 19-Feb-03

| | |
|----------------------------|-------------------------|
| CLIENT: | O'Reilly, Talbot & Okun |
| Lab Order: | 0302064 |
| Project: | 076-22-01 Crane |
| Lab ID: | 0302064-02B |
| Matrix: GROUNDWATER | |
| Collection Date: | 2/10/03 |
| Tag Number: | |
| Client Sample ID: | CBA-2 |
| Analyses | |
| Result | RL Qual Units |
| Date Analyzed | DF |

Analyst: RKK

EXTRACTABLE PETROLEUM HYDROCARBONS MAEPH

| Compound | Result | RL | Qual | Units | DF | Date Analyzed |
|--------------------------------|--------|--------|------|-------|----|--------------------|
| C9-C18 Aliphatic Hydrocarbons | ND | 100 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| C19-C36 Aliphatic Hydrocarbons | 160 | 100 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| C11-C22 Aromatic Hydrocarbons | 970 | 100 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Naphthalene | 1.5 | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| 2-Methylnaphthalene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Acenaphthylene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Acenaphthene | 2.7 | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Fluorene | 1.2 | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Phenanthrene | 3.1 | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Anthracene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Fluoranthene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Pyrene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Benz(a)anthracene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Chrysene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Benzo(b)fluoranthene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Benzo(k)fluoranthene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Benz(a)pyrene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Dibenz(a,h)anthracene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Indeno(1,2,3-cd)pyrene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Benzo(g,h,i)perylene | ND | 1.0 | | µg/L | 1 | 2/17/03 1:32:00 PM |
| Surr-1-Chlorooctadecane | 76.1 | 40-140 | | %REC | 1 | 2/17/03 1:32:00 PM |
| Surr-2-Bromonaphthalene | 103 | 40-140 | | %REC | 1 | 2/17/03 1:32:00 PM |
| Surr-2-Fluorobiphenyl | 94.2 | 40-140 | | %REC | 1 | 2/17/03 1:32:00 PM |
| Surr-o-Terphenyl | 84.6 | 40-140 | | %REC | 1 | 2/17/03 1:32:00 PM |

Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range. EPH: C11-C22 Aromatic Hydrocarbons exclude the concentration of target PAH analytes. VPH: C5-C8 Aliphatic Hydrocarbons exclude the concentration of target analytes eluting in this range and concentration of C9-C10 Aromatic Hydrocarbons.

CERTIFICATION

Were all QA/QC procedures required by the VPH or EPH method followed: Yes No - If No, See Case Narrative
 Were all performance/acceptance standards for required QA/QC procedures achieved: Yes No - If No, See Case Narrative
 Were any significant modifications made to the method as specified in section 11.3: Yes No - Details enclosed

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

SIGNATURE: 
 PRINTED NAME: Nancy Stewart
 POSITION: Laboratory Director (or designee)
 DATE: 2/28/03

Qualifiers: RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.
 ND - Not Detected at the Reporting Limit
 S - Spike Recovery outside accepted recovery limits
 E - Value above quantitation range
 # - See Case Narrative
 J - Analyte detected below quantitation limits
 R - RPD outside accepted recovery limits
 H - Method prescribed holding time exceeded

AMRO Environmental Laboratories Corp.

Date: 25-Feb-03

CLIENT: O'Reilly, Talbot & Okun

QC SUMMARY REPORT

Work Order: 0302064

Sample Duplicate

Project: 076-22-01 Crane

Sample ID 0302066-02BDUP Batch ID: 8560

Test Code: MAEPH Units: µg/L

Analysis Date 2/17/03 5:10:00 PM

Prep Date 2/17/03

Client ID:

Run ID: SV-2_030217A

SeqNo: 281476

| Analyte | QC Sample Result | RL | Units | QC Spike Amount | Original Sample Result | %REC | LowLimit | HighLimit | Original Sample or MS Result | %RPD | RPDLimit | Qua |
|--------------------------------|------------------|-----|-------|-----------------|------------------------|------|----------|-----------|------------------------------|------|----------|-----|
| | | | | | | | | | | | | |
| C9-C18 Aliphatic Hydrocarbons | ND | 100 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| C19-C36 Aliphatic Hydrocarbons | ND | 100 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| C14-C22 Aromatic Hydrocarbons | ND | 100 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Naphthalene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| 2-Methylnaphthalene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Acenaphthylene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Acenaphthene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Fluorene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Phenanthrene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Anthracene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Fluoranthene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Pyrene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Benz(a)anthracene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Chrysene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Benzo(b)fluoranthene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Benzo(k)fluoranthene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Benzo(a)pyrene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Dibenz(a,h)anthracene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Indeno(1,2,3-cd)pyrene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Benzo(g,h,i)perylene | ND | 1.0 | µg/L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | |
| Surr. 1-Chlorocladecane | 12.24 | 1.0 | µg/L | 20 | 0 | 61.2 | 40 | 140 | 0 | 0 | 0 | |
| Surr. 2-Bromonaphthalene | 18.75 | 1.0 | µg/L | 20 | 0 | 93.8 | 40 | 140 | 0 | 0 | 0 | |
| Surr. 2-Fluorobiphenyl | 17.54 | 1.0 | µg/L | 20 | 0 | 87.7 | 40 | 140 | 0 | 0 | 0 | |
| Surr. o-Terphenyl | 15.93 | 1.0 | µg/L | 20 | 0 | 79.6 | 40 | 140 | 0 | 0 | 0 | |

Qualifiers: ND - Not Detected at the Reporting Limit

S - Spike Recovery outside accepted recovery limits

B - Analyte detected in the associated Method Blank

J - Analyte detected below quantitation limits

R - RPD outside accepted recovery limits

NA - Not applicable where J values or ND results occur

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

AMRO Environmental Laboratories Corp.

Date: 25-Feb-03

CLIENT: O'Reilly, Talbot & Okun
 Work Order: 0302064
 Project: 076-22-01, Crane

QC SUMMARY REPORT
 Sample Matrix Spike Duplicate

Sample ID: 0302064-04BMSD Batch ID: 8560

Client ID: OTO-17

Test Code: MAEPH Run ID: SV-2_030217A

Units: µg/L

Analysis Date: 2/17/03 3:54:00 PM Prep Date: 2/17/03

SeqNo: 281461

| Analyte | QC Sample Result | RL | Units | QC Spike Amount | Original Sample Result | %REC | LowLimit | HighLimit | Original Sample or MS Result | %RPD | RPDLimit | Qua |
|--------------------------|------------------|-----|-------|-----------------|------------------------|------|----------|-----------|------------------------------|------|----------|-----|
| n-Eicosane | 6.184 | 1.0 | µg/L | 25.51 | 0 | 24.2 | 40 | 140 | 6.115 | 1.12 | 50 | S |
| n-Nonadecane | 5.52 | 1.0 | µg/L | 25.51 | 0 | 21.6 | 40 | 140 | 5.93 | 7.15 | 50 | S |
| n-Nonane | 10.19 | 1.0 | µg/L | 25.51 | 0 | 40 | 40 | 140 | 10.8 | 5.82 | 50 | S |
| n-Octacosane | 6.816 | 1.0 | µg/L | 25.51 | 0 | 26.7 | 40 | 140 | 6.615 | 3 | 50 | S |
| n-Tetradecane | 2.801 | 1.0 | µg/L | 25.51 | 0 | 11 | 40 | 140 | 3.25 | 14.8 | 50 | S |
| Naphthalene | 15.98 | 1.0 | µg/L | 25.51 | 0 | 62.6 | 40 | 140 | 17.49 | 9.03 | 50 | S |
| Acenaphthene | 18.67 | 1.0 | µg/L | 25.51 | 0 | 73.2 | 40 | 140 | 20.08 | 7.28 | 50 | S |
| Anthracene | 20.51 | 1.0 | µg/L | 25.51 | 0 | 80.4 | 40 | 140 | 21.88 | 6.49 | 50 | S |
| Pyrene | 19.9 | 1.0 | µg/L | 25.51 | 0 | 78 | 40 | 140 | 21.6 | 8.15 | 50 | S |
| Chrysene | 15.03 | 1.0 | µg/L | 25.51 | 0 | 58.9 | 40 | 140 | 15.64 | 3.98 | 50 | S |
| Surr. 1-Chlorooctadecane | 2.582 | 1.0 | µg/L | 20.41 | 0 | 12.6 | 40 | 140 | 0 | 0 | 0 | S |
| Surr. 2-Bromonaphthalene | 18.06 | 1.0 | µg/L | 20.41 | 0 | 88.5 | 40 | 140 | 0 | 0 | 0 | S |
| Surr. 2-Fluorobiphenyl | 17.46 | 1.0 | µg/L | 20.41 | 0 | 85.6 | 40 | 140 | 0 | 0 | 0 | S |
| Surr. o-Terphenyl | 13.23 | 1.0 | µg/L | 20.41 | 0 | 64.8 | 40 | 140 | 0 | 0 | 0 | S |

Qualifiers: ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

RL - Reporting Limit; defined as the lowest concentration the laboratory can accurately quantitate.

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

B - Analyte detected in the associated Method Blank

NA - Not applicable where J values or ND results occur

APPENDIX D
GROUNDWATER SAMPLE COLLECTION RECORDS

293 Bridge Street
Suite 500
Springfield, MA 01103
Tel 413 788 6222
Fax 413 788 8830
Email office@oto-env.com

Ground Water Sampling Log (Conventional)

Project Number 076-22-01
Location Spfld MA
Sample CEV-2
Sampler Analytainers
Start Time 10:18
Source: Ground Water Surface Water Other
Sampling Method: Grab Bailor Other
Finish Time _____
Weather overcast
Sampling Sequence #1
Date 2/10/09
Project Crane

Sample Location Map (Sketch):

WELL DATA

Well Diameter 8"
Well Depth 33'
Volume of Water Purged 7 Liters
Measuring Point: Top of PVC Curb Box Other
Condition of Well PVC stringer, no box or stand pipe
Comments

WATER DATA

PH 7.13
Sample Depth _____
Appearance _____
Specific Conductance 777 μ S
Temperature 9.5°C
Odor _____

ANALYSIS

| Analysis | Bottle(s) | Preservative |
|----------|-----------|--------------|
| | | |
| | | |
| | | |
| | | |

Notes and Observations: duplicate sample taken (61-nd) (CEV-2D)

GROUNDWATER OR SURFACE WATER SAMPLING RECORD

PROJECT: 076-22-01 *Gene*
 LOCATION: *Field M*
 SAMPLING PERSONNEL: *Andy Conings*
 DATE: *2/16/03* STARTING TIME:
 FINISHING TIME:
 SAMPLE DESIGNATION: *076-17*
 SAMPLING SEQUENCE NO: *#2*
 SAMPLE LOCATION MAP (SKETCH):

SOURCE: GROUNDWATER SURFACE WATER OTHER
 SAMPLING METHOD: GRAB BAILEY OTHER (describe)

WELL DATA

MEASURING POINT: (Top of PVC/Curb Box...ect): *top of PVC*
 WELL DIAMETER: *2"* DEPTH OF WATER: *16.11'* WELL DEPTH: *23*
 STANDING WATER: *1.29* VOLUME OF WATER PURGED: *13L*
 CONDITION OF WELL:
 COMMENTS:

WATER DATA

APPEARANCE:
 ODOR:
 PH: *7.37*
 SPECIFIC CONDUCTANCE: *464 us*
 TEMPERATURE: *9.4°C*
 SAMPLE DEPTH:

| ANALYSIS | BOTTLE (S) | PRESERVATIVE |
|----------|------------|--------------|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

NOTES AND OBSERVATIONS:

APPENDIXE
PUBLIC NOTIFICATION LETTERS

Environmental Safety Health Geotechnical

293 Bridge Street, Suite 500
Springfield, MA 01103

Tel 413 788 6222
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www.otecomplis.com



O'Reilly, Talbot & Okun
[ASSOCIATES]

j076-22-01
June 25, 2003

City of Springfield
Board of Health
36 Court Street
Springfield, Massachusetts 01103

City of Springfield
Office of the Mayor
36 Court Street
Springfield, Massachusetts 01103

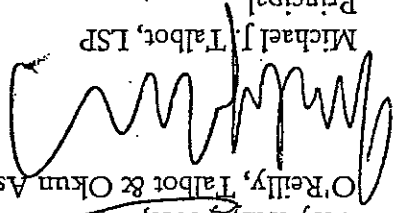
Re: MCP Phase II/III Report
225 Goodwin Street
Springfield, MA
DEP Site No. 1-616

To whom it may concern:

This letter is submitted on behalf of the City of Springfield Planning Department to notify you that a Massachusetts Contingency Plan (MCP) Phase II/III report has been filed with the Massachusetts Department of Environmental Protection for the above-referenced site in the Indian Orchard section of Springfield.

Copies of this document are available for review at the Planning Department office or at the DEP's Western Regional office located at 436 Dwight Street in Springfield under release tracking No. 1-616. DEP is open for file review on Wednesdays during normal business hours.

If you have any questions in this matter, please feel free to give call me or Ms. Katie Galuzzo at the Springfield Planning Department.

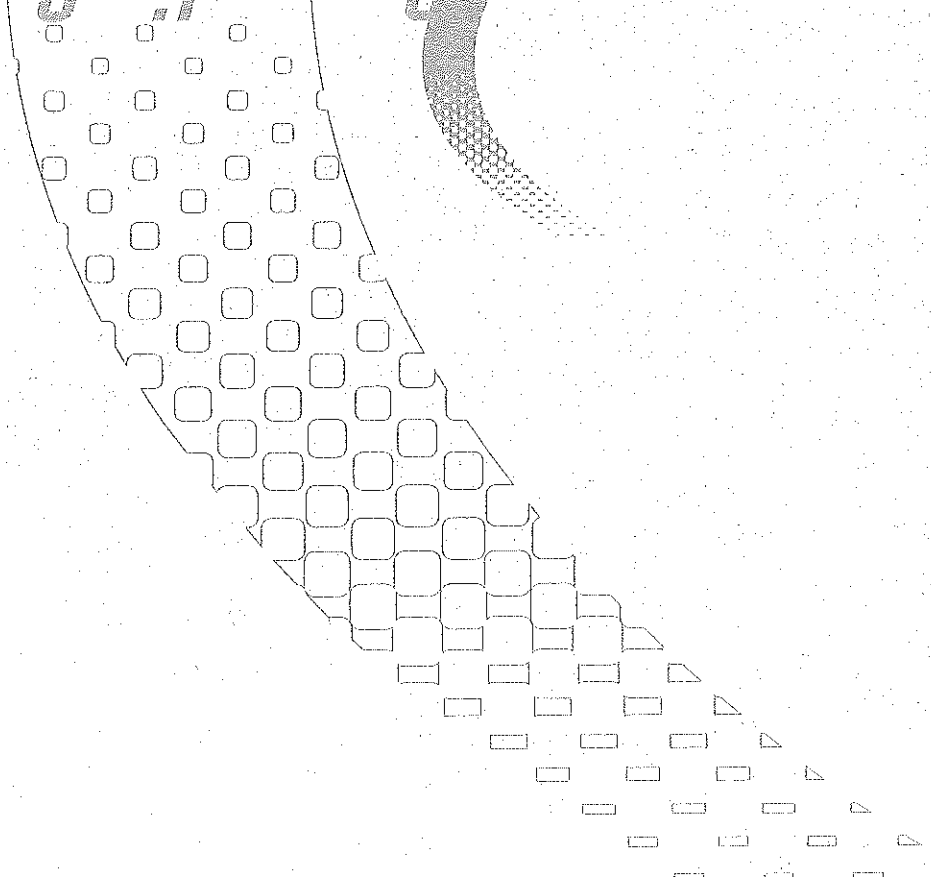
Very truly yours,
O'Reilly, Talbot & Okun Associates, Inc.

Michael J. Talbot, LSP
Principal

Contact Plans and Specs

APPENDIX C

Weston & Sampson

Appendix C



SECTION 01014

SCOPE AND SEQUENCE OF WORK

PART 1 - GENERAL

1.01 WORK INCLUDED

A. As indicated in the Contract Drawings and Specifications, the scope of the proposed work includes the building demolition and abatement of hazardous materials at the former Chapman Valve manufacturing facility, which consists of:

Goodwin Street: an approximately 134,000 square foot (sf) former foundry building. The building consists of an approximately 119,500 sf single-story structural steel-framed foundry portion, a 5,200 sf single-story former X-ray lab portion of reinforced concrete construction, and a 9,600 sf two-story office portion consisting of reinforced concrete, brick and concrete masonry unit (CMU) construction. The building generally consists of a built-up tar and gravel roofing system on a concrete roof deck, corrugated metal and corrugated transit wall paneling, reinforced concrete basement, HVAC, plumbing and electrical systems. The foundry portion includes three (3) gantry cranes. The office portion includes wood stud and gypsum wallboard wall systems, tile flooring, carpeting, fire-brick flooring systems, glazed block, wood paneling, and drop ceiling tiling. The scope of work also includes asbestos removal and disposal of demolition waste debris piles, recyclable material bales, tires, recyclable plastic, and miscellaneous trash and debris inside the building, utility cutting/capping/abandonment, utility pole and electrical wiring demolition, clearing and grubbing, and site restoration with loam and seed.

B. Contractor shall be aware that Goodwin Street adjacent to the Project property is used by local residents/students as a pedestrian/cyclist access route to a nearby school. The health and safety of residents/students is paramount. As such, the Contractor shall provide necessary site control/security measures, such as temporary construction fencing, warning signs, on-site traffic control, and restricted site access, to ensure that residents/students are protected from demolition/abatement activities throughout the Contract duration. Any occasional need for the Contractor to move fencing or signage to properly protect residents/students shall be considered incidental to the project.

C. The Contractor shall be permitted to store and/or stage materials, equipment, vehicles, or other related items as indicated on Sheet C-2, Demolition Plans.

D. Contractor's operations at the site are restricted to the Contract Limit of Work shown and any additional constraints presented in these Specifications, except for work specified and indicated to occur beyond the Limit of Work (e.g. traffic control, access to the site, etc.).



SECTION 01110

CONTROL OF WORK AND MATERIALS

1. Hauling, Handling and Storage of Materials
2. Open Excavations
3. Maintenance of Traffic
4. Care and Protection of Property
5. Protection and Relocation of Existing Structures and Utilities
6. Maintenance of Flow
7. Rejected Materials and Defective Work
8. Sanitary Regulations
9. Safety and Health Regulations
11. Site Investigation
10. Electric Service
11. Hazardous Waste

- A. The Contractor shall, at his own expense, handle and haul all materials furnished by him and shall remove any of his surplus materials at the completion of the work.
- B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him that are liable to injury and shall be responsible for any loss of or damage to any equipment or materials by theft, breakage, or otherwise.
- C. All removed, demolished and/or excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such location as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.
- D. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

2. Open Excavations

- A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe means for completely covering all open excavations and for accommodating travel when work is not in progress.

Contractor, such property shall be promptly restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer.

B. The Contractor shall not enter upon nor occupy with personnel, equipment or materials any property outside of the designated limit of work, except with the written consent of the property owner or property owner's agent.

C. If any direct or indirect damage is done to public or private property outside of the limits of work by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be promptly restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer. Suitable materials and methods shall be used for such restoration. Restoration of existing property and structures shall be carried out as promptly as practicable and shall not be left until the end of the construction period.

D. For work performed outside the limit of work shown on the drawings, such as public street openings, existing paved and unpaved surfaces adjacent to the limit of work shall be properly maintained and kept constantly in repair by the Contractor. On paved surfaces the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are shaped so as to cut or otherwise damage such surfaces; any damage caused during the construction operations shall be immediately repaired at the Contractor's expense.

E. All land resources within the project boundaries and outside the limits of permanent work performed under this Contract shall be preserved in their present condition or be restored to a condition by completion of construction at least equal to that which existed prior to work under this Contract.

5. Protection and Relocation of Existing Structures and Utilities

A. All existing buildings, utilities, pipes, poles, wires fences, curbing, property line markers and other structures which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the contractor. Should such property be damaged, it shall be restored by the Contractor, at no additional cost to the Owner.

B. The location of existing underground services and utilities shown on the Contract Drawings are based on available records. Although these documents may indicate the approximate location of existing utilities in the vicinity of the work, it is not warranted that all existing utilities and services are shown, nor that indicated locations are correct. The Contractor shall coordinate all work involving utilities and shall verify the existing conditions of the areas in which the work is to be performed. In addition, the Contractor's attention is directed to the fact that there are existing aboveground utilities, at and in the immediate vicinity of the work. The Contractor shall identify all aboveground services prior to commencement of the work, and

- A. Sanitary conveniences for the use of all persons employed on the work, properly screened from public observation, shall be provided in sufficient numbers in such manner and at such locations as may be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The Contractor shall rigorously prohibit the committing of nuisances within, on or about the work. Any employees found violating these provisions shall be discharged and not again employed on the work without the written consent of the Engineer. The sanitary conveniences specified above shall be the obligation and responsibility of the Contractor.
- B. Contractor shall use heavy-duty refuse containers with tight-fitting domed lids, with a spring-loaded flap, for disposal of all garbage and trash associated with food. Maintain these containers so there are no openings that allow access by rodents. Refuse containers shall be emptied daily to maintain site sanitation.
- C. Contractor shall not dispose of food, garbage, or trash associated with food in dumpsters or other containers being utilized for disposal of demolition debris.
- D. Within five days after the date of the Notice to Proceed, Contractor shall remove all trash, and debris from areas within the Active Limit of Work.

8. Sanitary Regulations

- A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work.
- B. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.
- C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or his employees, as determined by the Engineer, occurring previous to the final payment.

7. Rejected Materials and Defective Work

- C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by his operations as described in Section 01740, CLEANING UP.
- D. The Contractor shall maintain flow and keep in operation the fire hydrants for fire suppression purposes, in accordance with Section 00890, PERMITS.
- safeguarded so as not to impede drainage or to cause siltation of downstream areas in any manner whatsoever. If the Contractor damages or impairs any of the aforesaid drainage facilities, he shall repair the same within the same day.



SECTION 01310

CONSTRUCTION SCHEDULING

PART 1- GENERAL

1.01 PROGRAM DESCRIPTION

A. Critical Path Method (CPM) construction schedule shall be used to control the work of this Contract and to provide a definitive basis for determining job progress. The CONTRACTOR shall prepare the construction schedule. All work shall be done in accordance with the established CPM schedule and the CONTRACTOR and his subcontractors shall be responsible for cooperating fully with the ENGINEER and the OWNER in effectively utilizing the CPM schedule. CONTRACTOR shall be aware that the work shall be done as two phases, as described in Section 01014 - SCOPE AND SEQUENCE OF WORK.

B. The CPM schedule to be prepared and submitted by the CONTRACTOR shall consist of a CPM network (diagram of activities) and a computer-generated schedule (print-out) as specified herein. The format shall be the activity-on-node precedence network.

C. The CONTRACTOR shall develop his own outline of the work and prepare his proposed CPM schedule. The computer-based schedule shall be the product of a recognized commercial computer software producer and shall meet all of the requirements defined herein.

1.02 QUALIFICATIONS

A. The CONTRACTOR shall have the capability of preparing and utilizing the specified CPM scheduling technique. A statement of CPM capability shall be submitted by the CONTRACTOR in writing to the ENGINEER within 10 days after the issuance of the Notice to Proceed to verify that either the CONTRACTOR's organization has in-house capability qualified to use the technique or that the CONTRACTOR employs a consultant who is so qualified. Capability shall be verified by description of the construction projects to which the CONTRACTOR or his consultant has successfully applied the CPM scheduling technique and which were controlled throughout the duration of the project by means of systematic use and updating of a computer-based CPM schedule. The submittal shall include the name of the individual on the CONTRACTOR's staff who will be responsible for the CPM schedule and for providing the required updating information.

1.03 NETWORK REQUIREMENTS

A. The network shall show the order and inter-dependence of activities and the sequence in which the work is to be accomplished as planned by the CONTRACTOR. The basic

F. To the extent that the network or any revision thereof shows anything not jointly agreed upon or fails to show anything jointly agreed upon, it shall not be deemed to have been approved by the ENGINEER. Failure to include on a network any element of work required for the performance of this Contract shall not excuse the CONTRACTOR from completing all work required within any applicable completion date, notwithstanding the review of the network by the ENGINEER.

G. Except where earlier completions are specified, CPM schedules, which show completion of all work prior to the contract completion date, may be approved by the ENGINEER but in no event shall they be acceptable as a basis for claim for delay against the OWNER by the CONTRACTOR.

1.04 COMPUTER-GENERATED SCHEDULE REQUIREMENTS

A. Each computer-generated schedule submittal from the CPM activity network shall include the following tabulations: a list of activities in numerical order, a list of activity precedence's, a schedule sequenced by Early Start Date and a schedule sequenced by Total Float. Each schedule shall include the following minimum items:

1. Activity numbers
2. Estimated duration
3. Activity description
4. Early start date (calendar dated)
5. Early finish date (calendar dated)
6. Latest allowable start date (calendar dated)
7. Latest allowable finish date (calendar dated)
8. Status (whether critical)
9. Estimated cost of the activity
10. Total float and free float

B. In addition, each schedule shall be prefaced with the following summary data:

1. Contract name and number
2. Contractor's Name
3. Contract duration

1.07 PROGRESS REPORTING

A. Progress under the approved CPM schedule shall be evaluated monthly by the CONTRACTOR. Not less than seven days prior to each monthly progress meeting, the CONTRACTOR shall evaluate the status of each activity on which work has started or is due to start, based on the preceding CPM schedule; to show actual progress, to identify those activities started and those completed during the previous period, to show the estimated time required to complete or the percent complete of each activity started but not yet completed and to reflect any changes indicated for the network. Activities shall not be considered complete until they are, in fact, 100 percent complete.

B. At each progress meeting the CONTRACTOR shall submit a narrative report based on the CPM schedule evaluation described above, in a format agreed upon by the CONTRACTOR and the ENGINEER. The report shall include a description of the progress during the previous period in terms of completed activities, an explanation of each activity which is showing a delay, a description of problem areas, current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates and an explanation of corrective action taken or proposed. This report, as well as the CPM Status Report, will be discussed at each progress meeting.

1.08 RESPONSIBILITY FOR SCHEDULE COMPLIANCE

A. Whenever it becomes apparent from the current CPM schedule and narrative report that delays to the critical path have resulted and the contract completion date will not be met, the CONTRACTOR shall take some or all of the following actions at no additional cost to the OWNER. He shall submit to the ENGINEER for approval, a written statement of the steps he intends to take to remove or arrest the delay to the critical path in the approved schedule.

1.09 ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME

A. If the CONTRACTOR desires to make changes in his method of operating which affect the approved CPM schedule, he shall notify the ENGINEER in writing stating what changes are proposed and the reason for the change. If the ENGINEER approves these changes, the CONTRACTOR shall revise and submit for approval, without additional cost to the OWNER, all of the affected portions of the CPM network. The CONTRACTOR shall adjust the CPM schedule only after prior approval of his proposed changes by the ENGINEER.

B. If the completion of any activity, whether or not critical, falls more than 100 percent behind its approved duration, the CONTRACTOR shall submit for approval a schedule adjustment showing each such activity divided into two activities reflecting completed versus uncompleted work.

SECTION 01380

HEALTH AND SAFETY PLAN

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This Section provides specific information and defines specific requirements of the CONTRACTOR regarding the preparation of a site-specific Health and Safety Plan and related items. As used in this Section, the word 'site' refers to the area encompassed by the Contract Limit of Work.

B. In addition to addressing health and safety issues associated with asbestos abatement, miscellaneous oil & hazardous materials removal, and demolition of lead-containing items, the Health and Safety Plan and related items of this Section are also to address general demolition and construction activities required under this Contract.

C. The following items are addressed in this Section.

1. Preparation of a Site-Specific Health and Safety Plan

2. Personal Protective Equipment

1.02 PREPARATION OF A SITE-SPECIFIC HEALTH AND SAFETY PLAN:

A. Prior to the start of work on the site, CONTRACTOR shall prepare and submit an initial site-specific Health and Safety Plan which includes consideration of all known and potential hazards at the site. Work may not proceed at the project site until the CONTRACTOR's Health and Safety Plan has been received by the ENGINEER.

B. CONTRACTOR shall be cognizant of the minimum health and safety plan standards set forth in 29 CFR 1910.120 and 29 CFR 1926. The Health and Safety Plan shall include, but not be limited to, the following minimum requirements:

1. Identification of the CONTRACTOR's General Supervisor, Site Health and Safety Officer, and Other Personnel Needed for Hazardous Waste Site Operations and Emergency Response and Their General Functions and Responsibilities.

2. Lines of Authority, Responsibility, and Communication Associated with Personnel Identified in Paragraph 1.02 B.1.

3. Copies of 40-hour OSHA HAZWOPER training and Confined Space training certificates, including most current refresher session certificates if applicable, for

END OF SECTION

A. The personal protective equipment required to provide the appropriate level of dermal and respiratory protection shall be determined based on the results of continuous air monitoring performed by the CONTRACTOR and the standards set forth in the CONTRACTOR'S Health and Safety Plan. The ENGINEER may conduct duplicate air monitoring for quality control purposes. Modified Level D protection shall be the minimum requirement for all on-site personnel, except during asbestos abatement activities, when higher levels of protection will be required, as specified in Section 02051 - ASBESTOS ABATEMENT (BUILDINGS).

1.04 PERSONAL PROTECTIVE EQUIPMENT:

C. Refer to and coordinate with Section 02051 - ASBESTOS ABATEMENT (BUILDINGS), Section 02075 - UNIVERSAL WASTE, Section 02115 - REMOVAL AND DISPOSAL OF UNDERGROUND STORAGE TANKS, Section 02220 - BUILDING DEMOLITION, AND Section 13282 - LEAD BASED PAINT REMOVAL AND LEAD DUST CLEANUP for additional elements and requirements to be included in the CONTRACTOR'S Health and Safety Plan.

22. Methods and Responsibility for Updating the Health and Safety Plan, as Necessary, and Provisions for Incorporating Parcel-Specific Addenda.

21. Procedures for Minimizing Electrical Hazards and Risks Posed by Overhead Wires.

20. Provisions for Pre-Entry Initial and Periodic Briefings.

19. Spill Containment Program - Develop and implement an Oil and Hazardous Materials Management and Spill Control Program to address inventory, storage, and on-site handling of oil and hazardous materials as defined by 310 CMR 40.1600, risk mitigation measures, and spill control and reporting procedures that will be implemented by the Contractor during construction. The OHM Program shall include complete descriptions of all methods, procedures, and Best Management Practices (BMP) proposed to insure compliance with appropriate environmental requirements of the Authority, the Massachusetts Department of Environmental Protection (DEP), the U.S. Environmental Protection Agency, and all others having jurisdiction.



SECTION 01562

DUST CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This Section specifies requirements for controlling dust generated during work of this Contract. Work activities requiring special attention to dust control include building demolition, stockpiling, compacting of debris, loading and removal of demolition debris from the site, and earthwork.

B. The CONTRACTOR is responsible for control of dust at all times during work of this Contract, 24 hours per day, 7 days per week, including non-working hours, weekends, and holidays.

1.02 RELATED WORK:

A. Section 00890 - PERMITS

B. Section 01519 - TEMPORARY FACILITIES

C. Section 01550 - TRAFFIC CONTROL

D. Section 01570 - ENVIRONMENTAL PROTECTION

E. Section 02220 - BUILDING DEMOLITION

F. Section 02051 - ASBESTOS ABATEMENT (BUILDINGS)

G. Section 02300 - EARTHWORK

1.03 REGULATORY REQUIREMENTS:

A. The CONTRACTOR shall perform all work specified under this Section in compliance with the Massachusetts Department of Environmental Protection, Code of Massachusetts Regulations (CMR) 310 CMR 7.00, "Air Pollution Control Regulations", specifically 310 CMR 7.09, "Dust, Odor, Construction and Demolition".

B. Work of this Contract shall be conducted in a manner that will not result in excessive particulate matter emissions, nuisance dust conditions, PM₁₀ (particulate matter with an aerodynamic diameter less than or equal to 10 microns) emissions, or PM₁₀

B. Calcium chloride shall be used to control dust instead of wet suppression when freezing conditions exist. Calcium chloride shall be uniformly applied by a mechanical spreader at 1 1/2 pounds per square yard, unless otherwise directed by the ENGINEER. Ensure vegetation or soil to be used for vegetation is not treated.

5. The CONTRACTOR shall provide the necessary means to retain on-site all water runoff generated by dust control and dispose of such water in accordance with the requirements of the appropriate regulatory agencies. The CONTRACTOR shall be responsible for providing water, a means of disposal, necessary permits, and all appurtenances required to control dust. Coordinate with the requirements of Section 01570 - ENVIRONMENTAL PROTECTION.

4. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

3. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.

2. Wet suppression equipment shall consist of sprinkler pipelines, tanks, tank trucks, or other devices capable of providing regulated flow, uniform spray, and positive shut-off.

1. Wet suppression consists of the application of water or a wetting agent in solution with water. Ensure wetting agent is not used on plantable soils.

A. Wet suppression shall be used to provide temporary control of dust. Several applications per day may be necessary to control dust depending upon meteorological conditions and work activity. The CONTRACTOR shall apply wet suppression on a routine basis as necessary or directed by the ENGINEER, to control dust. At a minimum, wet suppression shall be applied to demolition debris, excavated material, aggregate piles, and exposed soils and dirt.

3.01 CONSTRUCTION SITE DUST CONTROL - GENERAL:

PART 3 - EXECUTION

A. Water shall not be brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

2.04 WATER:

B. Calcium chloride failing to meet the requirements of the aforementioned specifications or that which has become caked or sticky in shipment, may be rejected by the ENGINEER.

END OF SECTION

E. Removal of asbestos-containing material shall be in accordance with Section 02051 - ASBESTOS ABATEMENT (BUILDINGS).

D. During transport of debris, the truck cargo area shall be securely covered.

C. Debris shall not be stockpiled. Debris shall be removed promptly from the site.

B. Closed chutes shall be used for the handling of debris. Dropping or throwing of debris is prohibited.

A. The CONTRACTOR shall use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in the air to the lowest practical level. Sufficient water shall be supplied for the building, demolition-related debris, and site compacting to meet Federal, State, and local air-quality regulations and to minimize dust during demolition.

3.05 DEMOLITION DUST CONTROL MEASURES:

B. The methods to be used shall be submitted to the ENGINEER as part of the Dust Control Plan.

4. The tarps shall be bermed 12" high at all edges to prevent any infiltration of storm water or exfiltration of leachate.

3. Polyethylene tarps on stockpiles shall be placed both below and on top of stockpiles, and secured with sandbags or an equivalent method to prevent the cover from being dislodged by the wind. The CONTRACTOR shall repair or replace covers whenever damaged or dislodged, at no additional cost to the OWNER.

2. Soil stabilizers applied to the surface of inactive stockpiles.

SECTION 01570

ENVIRONMENTAL PROTECTION

1. Description
2. Notification
3. Implementation
4. Area of Construction Activity
5. Protection of Water Resources
6. Protecting and Minimizing Exposed Areas
7. Location of Storage Areas
8. Protection of Landscape
9. Clearing and Grubbing
10. Discharge of Dewatering Operations
11. Dust Control
12. Separation and Replacement of Topsoil
13. Baled Hay or Straw
14. Silt Fence

The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.

2. Notification

The ENGINEER will notify the CONTRACTOR in writing of any non-compliance with the foregoing provisions. The CONTRACTOR shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the CONTRACTOR or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the CONTRACTOR fails to act promptly, the ENGINEER may order stoppage of all or part of the work until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the CONTRACTOR as a result of time lost due to any stop work orders shall be made unless it was later determined that the CONTRACTOR was in compliance.

3. Implementation

A. Prior to commencement of work, the CONTRACTOR shall meet with representatives of the ENGINEER to develop mutual understandings relative to compliance of the environmental protection program.

B. The CONTRACTOR shall submit for approval six sets of details and literature fully describing environmental protection methods to be employed in carrying out construction activities.

8. Protection of Landscape

- C. The ENGINEER may designate a particular area or areas where the CONTRACTOR may store materials used in his operations.
- D. Storage areas in cross-country locations shall be restored to pre-construction conditions with the planting of native species of trees and shrubs.

A. The CONTRACTOR shall not deface, injure, or destroy trees or shrubs nor remove or cut them without written authority from the OWNER. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the ENGINEER. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees which are not to be removed, particularly overhanging branches and limbs. The CONTRACTOR shall, in any event, be responsible for any damage resulting from such use.

B. Branches, limbs, and roots shall not be cut except by permission of the ENGINEER. All cutting shall be smoothly and neatly done without spitting or crushing. When there is unavoidable injury to branches, limbs and trunks of trees, the injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.

C. Where, in the opinion of the ENGINEER, trees may possibly be defaced, bruised, injured, or otherwise damaged by the CONTRACTOR's equipment or by his blasting or other operations, the ENGINEER may direct the CONTRACTOR to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the CONTRACTOR's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the CONTRACTOR. The ENGINEER will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of under the provisions of Section 02230, CLEARING AND GRUBBING.

D. Cultivated hedges, shrubs, and plants which could be injured by the CONTRACTOR's operations shall be protected by suitable means or shall be dug up, balled and temporarily replanted and maintained. After construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of a kind and quality at least equal to that existing at the start of the work.

9. Clearing and Grubbing

A. The Contractor shall clear and grub only on the Owner's land or the Owner's easements, and only the area required for demolition operations, as approved by the Engineer.

END OF SECTION

C. The silt fence shall be Mirafi Envirofence manufactured by Mirafi, Inc. or approved equal.

| Property | Value | Test Method |
|---|--------|-------------|
| 1. Grab Strength (lbs.) | 124 | ASTM D-4632 |
| 2. Elongation (%) | 15% | ASTM D-4632 |
| 3. Puncture Strength (lbs.) | 65 | ASTM D-4833 |
| 4. Burst Strength (psi) | 300 | ASTM D-3786 |
| 5. Trapezoid Tear (lbs.) | 60 | ASTM D-4533 |
| 6. Equivalent Opening Size (U.S. Sieve) | No. 30 | ASTM D-4571 |
| 7. Permittivity (sec ⁻¹) | 0.10 | ASTM D-4491 |
| 8. Water Flow Rate (gal/min/sf.) | 10 | ASTM D-4491 |
| 9. UV Resistance (%) | 70 | ASTM D-4355 |

B. The silt fence shall consist of a 3-foot wide continuous length sediment control fabric, stitched to a 22-foot wide, continuous length support netting, and stapled to preweathered oak posts installed as shown on the drawings. The oak posts shall be 1 1/2-inches by 1 1/2-inches (Minimum Dimension) by 48 inches and shall be tapered. The support netting shall be industrial strength polypropylene. The bottom edge of the sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall conform to the following properties:

A. Where indicated on the drawings or where directed by the ENGINEER, the CONTRACTOR shall erect and maintain a temporary silt fence. In areas designated as wetlands, the CONTRACTOR shall line the limits of the construction easement with a silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.

14. Silt Fence

To trap sediment and to prevent sediment from clogging drainage systems, baled hay or straw bales from breaking apart. The bales should be securely staked to prevent overturning, flotation, or displacement. All deposited sediment shall be removed periodically.

13. Baled Hay or Straw



SECTION 01740

CLEANING UP

1. DESCRIPTION:

A. The CONTRACTOR should be familiar with Section 00700 GENERAL CONDITIONS, Section 01110 CONTROL OF WORK AND MATERIALS, Section 01140 SPECIAL PROVISIONS, and Section 01570 ENVIRONMENTAL PROTECTION as they pertain to this section.

B. The CONTRACTOR must employ at all times during the progress of his work adequate cleanup measures and safety precautions to prevent injuries to persons or damage to property. The CONTRACTOR shall immediately, upon direction by the ENGINEER provide adequate material, equipment and labor to cleanup and make safe any and all areas deemed necessary by the ENGINEER.

2. DAILY CLEANUP:

A. The CONTRACTOR shall clean up, at least daily, all refuse, rubbish, scrap and surplus material, debris and unneeded construction equipment resulting from the construction operations and sweep the area. The site of the work and the adjacent areas affected thereby shall at all times present a neat, orderly and workmanlike appearance.

B. Upon written notification by the ENGINEER, the CONTRACTOR shall within 24 hours clean up those areas, which in the ENGINEER'S opinion are in violation of this section and the above referenced sections of the specifications.

C. If in the opinion of the ENGINEER, the referenced areas are not satisfactorily cleaned up, all other work on the project shall stop until the cleanup is satisfactory.

3. MATERIAL OR DEBRIS IN DRAINAGE FACILITIES:

Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

4. REMOVAL OF TEMPORARY BUILDINGS, STRUCTURES AND EQUIPMENT:

On or before completion of the work, the CONTRACTOR shall, unless otherwise specifically directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which

ASBESTOS ABATEMENT FOR UNDERGROUND UTILITIES

PART 1 - GENERAL

1.01 GENERAL:

A. This section specifies requirements for the removal of asbestos-containing material (ACM) if encountered during excavation, building foundation removal, or trenching operations. The work includes, but is not limited to, the removal and disposal of the following ACM's: asbestos cement pipe, asbestos cement pipe duct, asbestos insulated electrical cable, and asbestos insulated steam pipe.

B. All asbestos removal work is to be performed in accordance with these specifications, Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Department of Transportation (DOT), National Institute of Occupational Safety and Health (NIOSH), Massachusetts Department of Environmental Protection (DEP), Massachusetts Department of Labor and Workforce Development (DLWD), and other state and local regulations. Wherever there is a conflict or overlap of the above references, the most stringent provisions apply (see Paragraph 1.07 for specifics).

C. The Contractor shall have a current Massachusetts Department of Labor and Workforce Development (DLWD) Abatement Contractor's License and meet other qualification requirements specified. As used in this section, the Contractor refers to a licensed, certified asbestos abatement sub-contractor or the general contractor if so licensed and the subject work is not subcontracted.

D. As a description of the general scope of work, the Contractor shall provide as a minimum, the following services:

1. Hand excavate area around the ACM as needed. Necessary Shoring and trench stability shall be the responsibility of the General Contractor.
2. Remove all ACM piping from the work area, according to the procedures detailed in this section. The Contractor shall be responsible for providing all necessary lifting equipment.
3. Thoroughly clean each work area in order to meet visual inspection and final air clearance testing criteria referenced in this section.
4. Decontaminate and remove all equipment used to perform the work.
5. Properly dispose of all ACM, contaminated and non-contaminated waste material.

1. Supervisor: The Supervisor is the Competent Person as required by OSHA in 29 CFR 1926 for the Contractor and is the Contractor's representative responsible for

B. ADMINISTRATIVE AND SUPERVISORY PERSONNEL:

- 1. Administrative and supervisory personnel.
- 2. Special reports.
- 3. Contingency Plan.
- 4. Notifications to other entities at job site.

A. Minimum administrative and supervisory requirements necessary for coordination of asbestos abatement work on the project to be provided by the Contractor include but are not necessarily limited to the following:

1.05 PROJECT COORDINATION:

A. Prior to commencing any work under this Section, the Contractor shall submit to the Engineer items in accordance with Paragraph 1.08 of Section 02051, ASBESTOS ABATEMENT (BUILDINGS).

1.04 SUBMITTALS:

- A. Section 01110, CONTROL OF WORK AND MATERIALS
- B. Section 00890, PERMITS
- C. Section 01380, HEALTH AND SAFETY PLAN
- D. Section 01570, ENVIRONMENTAL PROTECTION
- E. Section 01740, CLEANING UP
- F. Section 02051, ASBESTOS ABATEMENT (BUILDINGS)
- G. Section 0221, ABANDONMENT OF EXISTING WATERMANS
- H. Section 0222, ABANDONMENT OF SEWERS AND DRAINS
- I. Section 02300, EARTHWORK

1.03 RELATED WORK:

1.06 SCHEDULES AND REPORTS:

A. COORDINATION: Contractor shall provide close coordination of the progress schedule, schedule of submittals, and progress reports. Contractor shall distribute each report to all parties involved in the work including the Engineer.

B. DAILY LOG: Contractor shall maintain within the Decontamination Facility a daily log documenting the dates and time of but not limited to, the following items:

- 1. Meetings; purpose, participants, discussion (brief)
- 2. Visitation; authorized and unauthorized
- 3. Personnel, by name and Social Security Number, entering and leaving the work area
- 4. Special or unusual events, e.g., barrier breaching, equipment failures
- 5. Air monitoring tests and test results as required by OSHA

C. Contractor shall document, with confirmation signature of the Engineer, the following:

- 1. Inspection of work area preparation prior to start of removal and daily thereafter
- 2. Removal of any polyethylene barriers
- 3. Contractor's inspections prior to encapsulation
- 4. Removal of waste materials from work area
- 5. Decontamination of equipment (list items)
- 6. Contractor's final inspection/final air test analysis.

D. Contractor shall provide two copies of the daily log and above documentation at final closeout of project for use by the Engineer.

1.07 GENERAL APPLICABILITY OF CODES, REGULATIONS AND STANDARDS:

A. Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith. All regulations by these and other governing agencies in their most recent version are applicable.

State requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include the following:

- C. STATE REQUIREMENTS:
1. Massachusetts Department of Labor and Workforce Development Regulations for the Removal, Containment and Encapsulation of Asbestos, Title 453, Section 6.00 of the Code of Massachusetts Regulations
 2. Massachusetts Department of Environmental Protection:
 - a. Air Pollution Control Regulations, Title 310, Chapter 7, Section 7.15 of the Code of Massachusetts Regulations
 - b. Solid Waste Regulations, Title 310, Chapters 18 and 19 of the Code of Massachusetts Regulations
 3. Title 45, Code of Massachusetts Regulations, Part 10, Division of Industrial Safety
- D. LOCAL REQUIREMENTS:
- Contractor shall abide by all local requirements, which govern asbestos abatement work or hauling and disposal of asbestos waste materials.
- E. STANDARDS:

Standards which govern asbestos abatement work or hauling and disposal of asbestos waste materials include the following:

1. American National Standard Institute (ANSI):
 - a. Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Publication Z9.2-79
 - b. Practices for Respiratory Protection, ANSI Publication Z288.2-80
2. ASTM - American Society for Testing and Materials
3. UL - Underwriters Laboratories, Inc.

1.08 NOTIFICATIONS, PERMITS, AND LICENSES:

A. AGENCY NOTIFICATION: As required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40CFR 61, Subpart M),

F. All materials, tools, and equipment must comply, at a minimum, with this specification, and relevant federal, state and local codes.

2.02 MATERIALS, TOOLS, AND EQUIPMENT:

A. RESPIRATOR PROTECTION EQUIPMENT:

1. Air Purifying Respirators:
 - a. Respirator Bodies: Provide half face or full face type respirators. Equip full-face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees Fahrenheit.
 - b. Filter Cartridges: Provide, at minimum, HEPA type filters labeled with NIOSH and MSHA certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color-coded in accordance with ANSI Z228.2 (1980). In addition, a chemical cartridge section may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.
 - c. Non-permitted Respirators: Do not use single use, disposable or quarter face respirators.

B. WETTING MATERIALS: For wetting before disturbance of asbestos-containing materials use either amended water or a removal encapsulant. The material must be odorless, non-flammable, non-toxic, non-irritating, and non-carcinogenic. It shall be applied as a mist using a low-pressure sprayer recommended by the manufacturer.

1. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the asbestos containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of a surfactant consisting of 50% polyoxyethylene ether mixed with five gallons of water.

2. Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of asbestos containing material. Use a material which results in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with one ounce of a surfactant consisting of 50% polyoxyethylene ether and 50% polyoxyethylene ether mixed with five gallons of water.

H. WARNING SIGNS AND LABELS: Shall comply with 29 CFR 1926.59(k), and all other federal, state, or local codes and regulations.

I. LADDERS OR SCAFFOLDS: Shall be OSHA-approved, and be of sufficient dimensions and quantities so that the Engineer, workers, and other inspectors can easily and safely access all work surfaces. Scaffold joints and ends shall be sealed with tape to prevent incursion of asbestos fibers.

J. HAND POWER TOOLS: Shall be equipped with HEPA-filtered local exhaust ventilation if used to drill, cut into, or otherwise disturb ACM.

K. BRUSHES: All brushes shall have nylon bristles. Wire brushes are excluded from use due to their potential to shred asbestos fibers into small fibers. Wire brushes may be used on pipe joint applications upon prior written notice to the Engineer.

L. HEPA-VACUUM CLEANER: Each HEPA-vacuum cleaner shall be separately equipped with an airtight, securely attached hose, of proper length, and a collection wand, brush, and other special attachments appropriate to the required cleaning tasks. The equipment shall be properly operated at all times and shall contain no air leaks. The Engineer may inspect all vacuuming equipment before its use and may request verification of the efficiency of the filtration of the equipment.

M. TWO WAY RADIOS: Provide General Superintendent and all Work Area Supervisors and Foremen with compatible two-way radios.

PART 3 - EXECUTION

3.01 GENERAL:

A. PRE-ASBESTOS ABATEMENT PREPARATIONS: Prior to completion of excavation work, the Contractor will set-up the work area as follows:

1. Demarcate, at ground level, the boundaries of the work area and post required warning signs in English meeting the requirements of OSHA 29 CFR 1926.1101.

2. Construct barriers as required to isolate the work area.

3. Install Decontamination Facility, including location and method for entering and exiting the work area.

4. Install and test temporary power and lighting. All Contractor costs associated with the isolation of electrical systems and installations of temporary power and lighting systems and installations of temporary power and lighting must be included in his prices.

jurisdiction over the work. The Contractor's Supervisor shall at all times monitor the entrance to the Decontamination Facility to prevent unauthorized people from entering, and to maintain a written log of all people entering the work area.

3.02 ASBESTOS REMOVAL DURING EXCAVATION:

A. This section is provided for removal of asbestos-containing materials in excavation areas. The Contractor shall not begin any work until he has verified that the excavation (trench) has been adequately shored and that all pertinent safety systems are in place. Refer to Paragraph 1.01.D.1 for responsibility of providing shoring and support.

B. REMOVAL OF FRIABLE ASBESTOS MATERIALS: This section refers to removal of asbestos-containing materials which are defined by 40 CFR Part 61.141 as friable asbestos containing. Refer to Paragraph 1.01.D.2 for responsibility of providing power equipment for lifting in required.

1. Prepare work area as described in Section 3.01.

2. Carefully excavate, by hand, a sufficient area around the material to perform the abatement work. Any asbestos debris that is present or generated by these activities will be promptly wetted and placed into 6-mil asbestos waste bags before continuing with the work.

3. Once excavation is complete, place one layer of 6-mil polyethylene sheeting on sidewalls and bottom of trench under the ACM to be removed.

4. Thoroughly wet all asbestos-containing materials with wetting materials as specified in Section 2.02B. Materials are to be kept wet at all times during abatement work.

5. Remove asbestos materials as follows:

a. Non-encased Friable Asbestos Material

1. Insulation shall be removed from all piping. Containment shall be constructed around each point where a section of pipe is to be cut.

2. For small diameter piping, glovebags may be used for containment. Remove approximately a 1 – foot width band of insulation from both ends of each section of piping to be cut.

3. Properly bag and dispose of any insulation and fallen debris from the removal operation.

allowed outside of a locked, secure waste transport vehicle. Massachusetts DEP approval is required before disposal of materials generated in this manner.

C. REMOVAL OF NON-FRIABLE ASBESTOS MATERIALS: This section refers to removal of asbestos-containing materials which are defined by 40 CFR Part 61.141 as non-friable asbestos-containing materials.

1. Prepare work area as described in Section 3.01.
2. Carefully excavate, by hand, a sufficient area around the material to perform the abatement work. Any asbestos debris that is present or generated by these activities will be promptly wetted and placed into 6-mil asbestos waste bags before continuing with the work.
3. Once excavation is complete, place one layer of 6-mil polyethylene sheeting on sidewalls and bottom of trench under the ACM to be removed.
4. Thoroughly encapsulate asbestos-containing materials with an acceptable penetrating encapsulant per manufacturer guidelines.
5. Remove asbestos materials as follows:

- a. Asbestos Cement Pipe or Pipe Duct: Cut material into manageable sections using HEPA-filtered saw. The Asbestos Contractor will take all necessary precautions to avoid any breakage of ACM. Cut ends of pipe will be immediately encapsulated. Cut sections of pipe will be removed from the trench and immediately wrapped and sealed in two layers of 6-mil asbestos waste bags. Packaged waste will then be placed into acceptable waste transportation vehicle.
- b. Asbestos-Containing Electrical Cable Wrap: Cut cable using mechanical cutting tool, such as bolt cutters. Encapsulate cut ends, place cut sections in double 6-mil asbestos waste bags, and place packaged waste into an acceptable waste transportation vehicle.

NOTE: Whenever possible, the Asbestos Contractor will limit cutting of asbestos cement materials and dismantle materials in intact sections.

- D. **CLEAN-UP AND WORK AREA DECONTAMINATION:**
 1. Before removing protective poly sheeting, carefully HEPA-vacuum or wet wipe all poly surfaces.

checking of the standard operating procedures, engineering controls, respiratory protection equipment, packaging, transporting and disposal of asbestos, decontamination facilities and procedures, and any other aspects of the abatement process that may impact the health and safety of the people and the pollution of the environment.

B. The Contractor shall bear all costs concerning the laboratory work required for the analyses.

C. The Engineer shall receive copies of all laboratory reports presenting the results of the Contractor's air monitoring and inspection program. All information shall be recorded in the Contractor's air monitoring log.

3.05 AIR MONITORING BY CONTRACTOR:

A. PERSONAL MONITORING:

1. The Contractor shall perform air monitoring as required to meet OSHA Requirements for maintenance of Time Weighted Average (TWA) fiber counts for the types of respiratory protection provided. The Engineer will not be performing air monitoring to meet these OSHA requirements.

2. The sampling person and analytical laboratory performing this work shall be an independent party not financially or managerially connected to the Contractor.

3. The laboratory shall be successfully participating in the AIHA/NIOSH Proficiency Analytical Testing (PAT) program and be certified by the Commonwealth of Massachusetts.

4. Air sampling materials and equipment requirements are as follows:

a. Sampling for analysis by phase contact microscopy shall employ cellulose ester collection filters with 0.8 micron pore size or less. Cassettes shall be loaded with filters under clean laboratory conditions. A 5.0 micron pore-size cellulose ester-backing filter shall be placed behind the collecting filter, followed by cellulose support pad and the cassette base. A metal cowl or an electrically conductive cowl shall be used in conjunction with the sampling train.

b. The filter assembly shall be upstream of all other components in the sampling train. An airflow-measuring device (when used) shall be downstream of the filter and the pump assembly, or integral with the pump assembly.

work, leave negative air system in operation and notify Engineer. Do not recommence work until authorized in writing by Engineer.

If airborne fiber counts exceed 0.1 fibers per cubic centimeter for any period of time, cease all work until fiber counts fall below 0.1 fibers per cubic centimeter and notify Engineer. Do not recommence work until authorized in writing by the Engineer.

b. Outside Work Area: If any air sample taken outside of the work area exceeds the base line established below, immediately and automatically stop all work.

1. Decontaminate the affected area in accordance with these specifications.
2. Respiratory protection shall be work in affected areas until area is cleared for re-occupancy.

3. Analytical Methods: The following methods will be used by the Contractor in analyzing filters used to collect air samples:

- a. Cellulose ester filters will be analyzed using NIOSH 7400. The Engineer will carry out this analysis at the job site.
- b. Polycarbonate filters may be analyzed using EPA Level 2 or AHERA protocol.

4. Baseline: Is an action level expressed in fibers per cubic centimeter which is ten percent greater than the largest of the following:

- a. Average of the samples collected on cellulose ester filters outside each work area.
- b. 0.01 fibers per cubic centimeter.

NOTE: If the Engineer determines (based on background tests by NIOSH Method 7400) that the normal levels of fibers in a work place are above 0.01 f/cc, this normal background level as determined by the Engineer shall be the air clearance criteria the Contractor must meet. Contractor shall assume final air testing shall require the following minimum times to perform: NIOSH Method 7400 - 6 to 12 hours; TEM Method 40 CFR Part 736 - 24 to 48 hours.

If the results of the final testing are not satisfactory, thorough wet cleaning and/or HEPA vacuuming, and/or removal of contaminated earth shall be repeated until the required decontamination levels are achieved. The Contractor shall bear all costs for follow-up testing should the area not pass clean-air on the first try.

B. After achieving the level of cleanliness and decontamination as specified herein and as confirmed by the final testing and checking, the Engineer may thoroughly inspect the space jointly with the Contractor. A final inspection report shall be prepared jointly by the Engineer and the Contractor.

END OF SECTION

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SECTION 02115

REMOVAL AND DISPOSAL OF UNDERGROUND STORAGE TANKS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This Section specifies requirements for the removal and disposal of six (6) 15,000 gallon, steel, underground storage tanks (USTs) and their contents, as shown on the drawings and specified herein. Four (4) of the tanks are believed to contain No.6 fuel oil. The Work also includes the removal and disposal of all associated piping from the tank(s), demolition, removal, and disposal of surface asphalt paving, concrete covers, vaults, and holding down slab (if encountered), the excavation and disposal of all associated contaminated soils and backfilling to original grade. For additional information, an MCP Phase II/III Report by O'Reilly, Talbot, & Okun Associates, Inc., dated June 25, 2003, containing information on the USTs is included as Attachment A to this Section.

- B. If a UST is encountered, this Section specifies requirements for the removal and disposal of potential UST which may be uncovered during activities under this Contract.

- C. The work also includes the sampling associated with UST removal, including confirmatory sampling in accordance with the Commonwealth of Massachusetts UST Closure Assessment Manual (DEP Policy # WSC-402-96) and as directed by the Engineer.

- D. The Owner will be considered the generator and will sign all manifests and bills of lading.

- E. The work of this Section shall be done as Alternate A of this Contract.

1.02 RELATED WORK:

- A. Due to the nature of the work described in this Section, the Contractor shall examine the Contract Documents thoroughly for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to, those listed below.

- B. Section 01014 – Scope and Sequence of Work

- C. Section 01110 – Control of Work and Materials

- D. Section 01380 – Health and Safety Plan

- B. Submit to the Engineer all pertinent information relating to the transport of material specified herein, including:
 - 1. Name and address of all transporters; and
 - 2. Name and address of any hazardous waste transporters (provide this information if any of the disposal or recycling facilities are out-of-state), plus:
 - a. United States Environmental Protection Agency (EPA) Identification Number and expiration date.
 - b. Proof of permit, license or authorization to transport hazardous waste in all affected states.
 - c. Proof of emergency service agreement with an emergency response contractor.
- C. Submit to the Engineer a schedule detailing the proposed sequence of operations to perform the work specified herein.
- D. Prepare health and safety information and requirements for the work associated with this Section. The information and requirements shall be incorporated into the Site-specific Health and Safety Plan submitted under Section 01380, Health and Safety Plan.
- E. Submittals specified in Paragraphs 1.03 A. through 1.03 D. above shall be accepted by the Engineer prior to Contractor executing the work of this Section.
- F. Provide a copy of all permits, completed shipping manifests/Bills of Lading, weight slips, and destruction certificates to the Engineer. Also provide the Engineer with ALL original Bills of Lading used to transport and dispose of soil and/or groundwater within 21 days of transportation from the Site. The Engineer shall only allow progress payments after receipt of those bills of lading.
- G. Submit to the Engineer a copy of any sampling analyses within 2 days of receipt of the laboratory reports for the sampling required in this Section. Analytical data shall be summarized and tabulated on an excel spreadsheet with comparison to Method 1 Risk Assessment criteria. Any exceedance should be bolded for review by the Engineer. The analytical data shall be kept confidential, distributed only to the Engineer.
- H. The Contractor is responsible for obtaining and completing applicable UST removal and disposal permits. These permits must be submitted to the Engineer for approval prior to commencement of any UST removal activities.

REFERENCES:

A. Applicable Codes, Standards, and Specifications, including, but not limited to:

The Contractor shall:

3.02 REMOVAL AND DISPOSAL OF UST CONTENTS:

- E. Refer to the Contract Drawings for additional requirements and information.
- D. Refer to Section 01570, Environmental Protection, for additional requirements associated with transport and removal of materials from the Site in addition to those presented below.
- C. Remove asphalt paving, concrete covers, and concrete vaults as necessary to remove USTs and excavate soil.
- B. All removal areas shall be adequately safeguarded by temporary barricades, fencing, caution signs, lights, and any other means necessary to prevent accidents to persons, or damage to property. Contractor shall take all precautions not to create a hazardous situation and shall implement special construction procedures as necessary.
- A. Upon uncovering a UST, the Contractor shall immediately cease work and notify the Engineer. The Contractor shall not remove the UST from its vicinity without approval from the Engineer. The Contractor shall not cause delay to the schedule of work due to uncovering or removing and disposing of USTs.

3.01 GENERAL REQUIREMENTS:

PART 3 - EXECUTION

- B. The Contractor shall notify the Engineer as to the source of the backfill material and provide samples as requested by the Engineer.
- A. Backfill material shall conform to the requirements indicated on the Contract Drawings and Section 02300.

2.02 FILL MATERIALS:

- C. All personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this work as indicated in the Site-specific Health and Safety Plan.
- B. Provide all equipment and materials necessary to collect, pump, sample, handle, remove, compact, bulk, containerize, clean, excavate and backfill, and otherwise properly prepare the materials associated with the removal of the USTs for disposal.

- 1. The removal of the USTs shall be conducted by the Contractor in Accordance with the requirements and procedures provided in the MA DEP Policy # WSC-402-96 entitled Commonwealth of Massachusetts Underground Storage Tank Closure Assessment Manual and all other applicable Federal, State, and Local regulations, Massachusetts Underground Storage Tank Regulations 527 CMR 9.00.
- 2. The Contractor shall not remove and dispose of any UST without approval from the Engineer.
- 3. When the work area is ready for inspection and the USTs are prepared for removal, arrange for inspection by the SFD and notify the Engineer of the arrangements. Following the inspection, and upon authorization by the Owner and Engineer, remove USTs, piping, and associated appurtenances.
- 4. Steam clean the USTs, associated piping, and appurtenances for shipment as non-hazardous waste. Wash water contaminated with petroleum shall be contained and pumped into a vacuum truck for off-Site disposal or recycling.
- 5. Before the USTs are removed, gases shall be purged from the USTs and the USTs shall be tested for flammable vapors in accordance with NFPA Volume 327 and all other applicable regulations.
- 6. Prior to removal from the Site for transport to a licensed tank disposal facility, the USTs shall be rendered dysfunctional by punching holes in the UST sidewalls and end walls.

A. General

3.05 REMOVAL AND DISPOSAL OF USTs AND ASSOCIATED PIPING:

- A. The Contractor shall, at all times during construction, provide and maintain proper and satisfactory means and devices for removal of all water entering excavations, and shall remove all such water promptly. Dewatering activities shall be performed in accordance with Section 01570, Environmental Protection and Section 02240, Dewatering.

3.04 GROUNDWATER CONTROL ASSOCIATED WITH UST REMOVAL:

- D. Excavation around USTs will continue as directed by the Engineer based on field screening/evidence of contamination in accordance with Section 02280. Once the limits of contaminated soil have been removed, The Contractor shall conduct confirmatory sampling in accordance with the Massachusetts UST Closure assessment manual (DEP Policy # WSC-402-96).



SECTION 02220

BUILDING DEMOLITION

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This Section specifies the demolition of the former Chapman Valve Manufacturing Facilities, located at 225 Goodwin Street, Springfield, MA at the locations shown on Drawing C-2: Demolition Plan. This demolition work is located within the Contract Limits of Work as shown on the Site Demolition Plans and as specified in Section 01014, SCOPE AND SEQUENCE OF WORK. The extent of building demolition work includes the removal and proper disposal of building structures and components, as specified herein. The CONTRACTOR shall verify the construction and condition information of each of the buildings as well as the information presented in these Contract Documents, by site inspection, and shall provide all resources to perform the building demolition work.

B. Extent of Physical Building Demolition

1. As part of Building Demolition, the CONTRACTOR shall remove the building structures of the 225 Goodwin Street property, inclusive of all structural and building components including floor coverings above floor slab grade.

2. The CONTRACTOR shall remove the building floor slab, and below grade foundation structures to a depth of 4 feet below top of floor slab grade, of the 225 Goodwin Street Property. This work shall be done as Alternate B of this Contract.

3. All utilities and equipment within the building footprint shall be removed from the site as property of the CONTRACTOR. Utility services to the building shall be disconnected/terminated/abandoned in accordance with Drawing C-3: Utility Demolition/Abandonment Plan. Any live utility feeds to the buildings must be terminated in accordance with the utility owner.

4. As part of Building Demolition, the CONTRACTOR shall remove and dispose of properly any furnishings, fixtures, equipment, mechanical aspects, and any and all other structural and non-structural improvements and aspects. CONTRACTOR should assume that furnishings of value that may have been observed by him during the pre-bid site inspection will become his property and shall be removed and properly disposed of by the CONTRACTOR, unless specifically identified to the contrary in these Contract Documents or as directed by the ENGINEER. All materials, both hazardous and non-hazardous, shall be removed, reused and/or transported to appropriate disposal facilities.

The following is a general description of the buildings to be demolished. The description is not complete and is provided only for the assistance of the CONTRACTOR. Details regarding the structures size and construction are not guaranteed to be correct and the CONTRACTOR shall not be able to make a claim based on their correctness. The CONTRACTOR shall visually inspect for verification, quantification, and completeness of the building's structural and non-structural systems to be demolished and removed, as well as the building's contents for removal and disposal.

1.03 DESCRIPTION OF BUILDINGS

D. Collection, treatment, and disposal of all lead-containing wastes shall be in strict accordance with current applicable federal, state, and local laws, rules, and codes, including, but not limited to, Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA), Occupational Safety and Health Act (OSHA), and USFPA. Refer to Section 13282 for additional requirements.

to Section 13282 for additional requirements.
or disagreement with the applicable federal, state, and local laws, rules, and codes. Refer

C. CONTRACTOR shall be aware that existing structures are painted with lead paint. Hence, demolition of the structures shall comply with all applicable lead paint regulations. CONTRACTOR performing this work shall be thoroughly knowledgeable of all federal, state and local laws, rules, and regulations regarding materials containing or coated with lead or lead products. By bidding this Contract, the CONTRACTOR is stating his expertise in this work and the City of Springfield shall not be responsible for any additional costs incurred by the CONTRACTOR as a result of any misunderstanding or disagreement with the applicable federal, state, and local laws, rules, and codes. Refer

B. Dispose or recycle all demolition debris in accordance with all applicable regulations.

A. Conform to applicable codes and requirements for demolition of structures, safety of adjacent structures, dust control, service utilities, and discovered hazards.

1.02 REGULATORY REQUIREMENTS:

5. The site shall be left in neat and safe condition leveled to existing grades outside the demolished buildings' footprint.

4. All other above-grade and at-grade manmade improvements, including flagpoles, signs, retaining walls, curbs, pavers, planters, and similar, and any associated foundations shall be removed in their entirety.

3. All utilities outside of the building footprints are to be abandoned in place unless otherwise noted in the Contract Documents.

buildings' footprints for verification and completeness of site appurtenances, improvements, amenities that are to be removed and disposed. Contractor shall not remove piles of debris located on site, outside the buildings.

A. Permits and Certificates: Submit permits and certificates to the Engineer prior to start of demolition work; coordinate with the requirements of Section 00890 - PERMITS. Items to be submitted include but are not limited to the following:

1. Permits and notices authorizing building demolition.
2. Certificates of severance of utility services.

B. Lead Compliance Plan: Prior to the start of demolition work, and no later than 15 calendar days after the date of the Notice to Proceed, submit a site-specific Lead Compliance Plan in accordance with OSHA Lead in Construction Standard 1926.62 that identifies all lead hazards and proper work procedures for the work of this section, and includes the required items listed below. This plan shall remain on file at the project site and be updated throughout the work as conditions warrant. Coordinate plan with the requirements of Section 13282 – LEAD BASED COATINGS REMOVAL AND LEAD DUST CLEANUP.

1. Employer's Hazard Communication Program, Worker "Right-to-Know", as identified by OSHA 1910.1200 HAZCOM.
2. Respiratory Protection Program including proper medical monitoring and respiratory protection program requirements, as required by 1926.62 and DLI regulations at 454 CMR 22.11, as currently amended.
3. Written description and acceptance, of all proposed procedures, methods, or equipment to be utilized. In all instances, CONTRACTOR must comply with all applicable federal, state and local regulations.
4. Proposed worker training and orientation plan which at a minimum includes a description of hazards and remediation methodologies, a review of worker protection requirements, proposed decontamination procedures, and location of wash stations and change areas.
5. The name and address of personal air monitoring laboratory(s) performing testing required by these Specifications and applicable regulations.

C. Demolition Plan: Prior to the start of demolition work, and no later than 30 calendar days after the date of the Notice to Proceed, submit a comprehensive Demolition Plan, stamped and signed by a Professional Engineer registered in the Commonwealth of Massachusetts, for the ENGINEER'S review and approval prior to demolition work. The Demolition Plan shall be coordinated with, and as appropriate include reference to, the various plans and submittals required by these Specifications. At a minimum the CONTRACTOR'S Demolition Plan shall specifically include and address the following.

1. Temporary structural supports as required during demolition, and any other protective structures. Particular attention shall be given to fall hazards.
2. Calculations for floor loading adequacy to support any equipment that the Contractor will have on any of the building floors during any phase of demolition.
3. Competent person to supervise the erection and dismantling of scaffold on-site.
4. Requirements and procedures for assuring trained and experienced workers.
5. Inspection and tagging program.
6. Drawings of engineered fall arrest systems designed by a professional engineer.
7. Utilization of completely decked working levels for the handling of materials.
8. Identification of prohibited activities, e.g. prohibition of the use of cross bracing as a working surface, climbing device or as handrails, etc.
9. Limitations of work during adverse weather conditions.
10. Provisions that only scaffold grade planking or equivalent be used.
11. Methods of temporary protection for the poles, overhead wires, and pole-mounted transformers on site, when, and if, applicable. These shop drawing submittals shall include a copy of the written approval from the electrical utility company and other affected overhead utility authorities, for the proposed protection of their overhead utility system. This protection system must clearly show that this utility service is adequately protected, and that worker and public safety is ensured in providing utility protection and performing the work of this Section.
12. Methods, equipment, and sequence of operations for the demolition of each building showing how the public is protected during such demolition.

D. Shop Drawings: Submit shop drawings, stamped and signed by a Professional Engineer registered in the Commonwealth of Massachusetts, for the ENGINEER'S review and approval at least four weeks prior to the associated demolition work. Each submittal shall include the reference to the Specification Section(s) and relative paragraph(s) being addressed in the submittal. At a minimum, shop drawings shall be submitted for the following and shall address the aspects identified.

- Confirmation from the facility(ies) that they will accept the type and quantities demolition materials.
- Description of CONTRACTOR'S procedures to manage and track materials and example of CONTRACTOR'S material tracking log.

- B. CONTRACTOR shall arrange and pay for disconnecting, removing, capping, and plugging utility services. Utility services disconnected at underground mains shall be repaired in accordance with the requirements of the affected utility company. Place markers to indicate location of disconnected services and indicate such locations on the Subsurface Location Survey required in this Section. Coordinate with the requirements of Section 00890 - PERMITS.
- C. The CONTRACTOR shall actively relocate construction fencing as necessary and appropriate to correspond to ongoing demolition operations.
- D. CONTRACTOR shall perform his operations in such a manner, including any necessary support of excavation and dewatering as specified in the Contract Documents, as to prevent movement or settlement of adjacent structures, or movement, settlement, or collapse of adjacent services and sidewalks. Cease operations and notify the ENGINEER immediately if safety of adjacent structures or services appear to be endangered. Do not resume operations until safety is restored. CONTRACTOR shall be solely responsible and liable for any such movement, settlement, damage, or injury due to his operations. Promptly repair damage at no cost to the OWNER. Coordinate with the requirements of Section 01110 - CONTROL OF WORK AND MATERIALS.
- E. CONTRACTOR shall ensure safe passage of persons around areas of demolition. Provide, erect, and maintain steel boardings, sidewalk shed, barricades, lighting, and guardrails as required to protect the general public, workers, and adjoining property. Coordinate with the requirements of Section 01550 - TRAFFIC CONTROL.
- F. Fall protection shall be provided whenever the work is at heights greater than six feet, and or where holes and openings exceed six feet in depth. CONTRACTOR shall provide barriers at floor openings and demolished stairways and vertical shafts, and maintain same at all times that a potential fall hazard to workers may exist. The design and use of personal fall arrest and restraint systems, and training of personnel shall comply with ANSI standards. Safety harnesses shall be required for all fall arrest systems. Safe access shall be maintained at all times by the use of scaffold ladders, stair towers, or other acceptable means. Platform planks shall be used in lieu of the commonly used single plank during erection and dismantling.
- G. Comply with governing regulations pertaining to environmental protection. Coordinate with the requirements of Section 01570 - ENVIRONMENTAL PROTECTION.
- H. Conduct demolition operations to prevent migration of dust, dirt, and debris to adjacent structures and improvements. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering into the air. All trucks must be covered when transporting debris from the work site. All vehicles leaving the job site must be cleaned to avoid distribution of dust and dirt to the surrounding areas. Coordinate with the requirements of Section 01562 - DUST CONTROL.

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END OF SECTION

1. The Material Tracking Log shall be updated no less than daily, and shall be available to the ENGINEER for review at all times during normal work hours.
 2. A copy of the complete Material Tracking Log shall be submitted to the ENGINEER prior to Final Completion.
- facility, the CONTRACTOR shall record at a minimum the following information: a) nature and description of material; b) associated Division 2 Specification Section under which the material was removed; c) business name of licensed hauler; d) vehicle identifier; e) weight or quantity of material in hauler's load; f) type of tracking document and associated document's unique alphanumeric identifier for bill of lading, manifest, or other record being used to track hauler's load; g) date of transport from the site; h) date of arrival at the receiving facility; and i) unique number or identifier of associated receiving facility weight slip or receipt.

SECTION 02221

ABANDONMENT OF EXISTING WATER MAINS

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers the abandonment of existing water mains, complete.

B. The CONTRACTOR shall abandon water mains as indicated on the drawings.

1.02 RELATED WORK:

A. Section 00890, PERMITS

B. Section 02300, EARTHWORK

C. Section 03302, FIELD CONCRETE

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 ABANDONMENT OF EXISTING WATER MAINS:

A. Sections of water mains that are to be abandoned in place shall have open ends plugged with concrete or brick and mortar to prevent the entrance of soil into the pipe after backfilling.

B. Any water main to be abandoned shall be cut at the locations indicated on the drawings. A watertight ductile iron cap with concrete backing shall be installed on the live main. If a gate valve or corporation stop exists at the connection, it shall be closed.

C. Valve boxes shall be removed from all valves and curb stops which are on the abandoned main.

D. Hydrants, including hydrant barrels to be abandoned shall be removed completely. Open pipe ends remaining shall be plugged with concrete or brick and mortar to prevent the entrance of soil into the pipe after backfilling.

END OF SECTION



SECTION 02222

ABANDONMENT OF SEWERS AND DRAINS

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This Section covers the abandonment of sewers and drains through various means including furnishing, handling and installation of all concrete and masonry plugs; and removal and disposal of manholes, as shown on the Drawings and specified herein.

B. The CONTRACTOR shall furnish all materials, tools, labor, and equipment to abandon existing sewers, combined sewers, and drains.

C. For sewers or drain connections uncovered during building demolition that are not shown on the Contract Drawings, the Contractor shall conduct dye-testing, test-pitting, or other means to determine the location of sewer and drain piping for the purposes of abandonment per this Section.

1.02 REFERENCES:

The following standards form a part of this specification, as referenced:

American Society for Testing and Materials (ASTM)

ASTM C32 Specifications for Sewer and Manhole Brick (Made from Clay or shale).

1.03 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

The CONTRACTOR shall submit six sets of its plan for abandoning existing pipe, showing equipment, methods and materials. The plan shall be submitted to and reviewed by the ENGINEER before construction.

PART 2 - PRODUCTS

2.01 PLUGS:

A. Plugs installed at the open ends of the pipe to be abandoned shall be 12-inch thick 3,000-psi cement concrete, or 8-inch thick brick masonry as directed. The pipes to be abandoned include all sewer, combined sewer, and drains as specified herein and as shown on the Drawings.

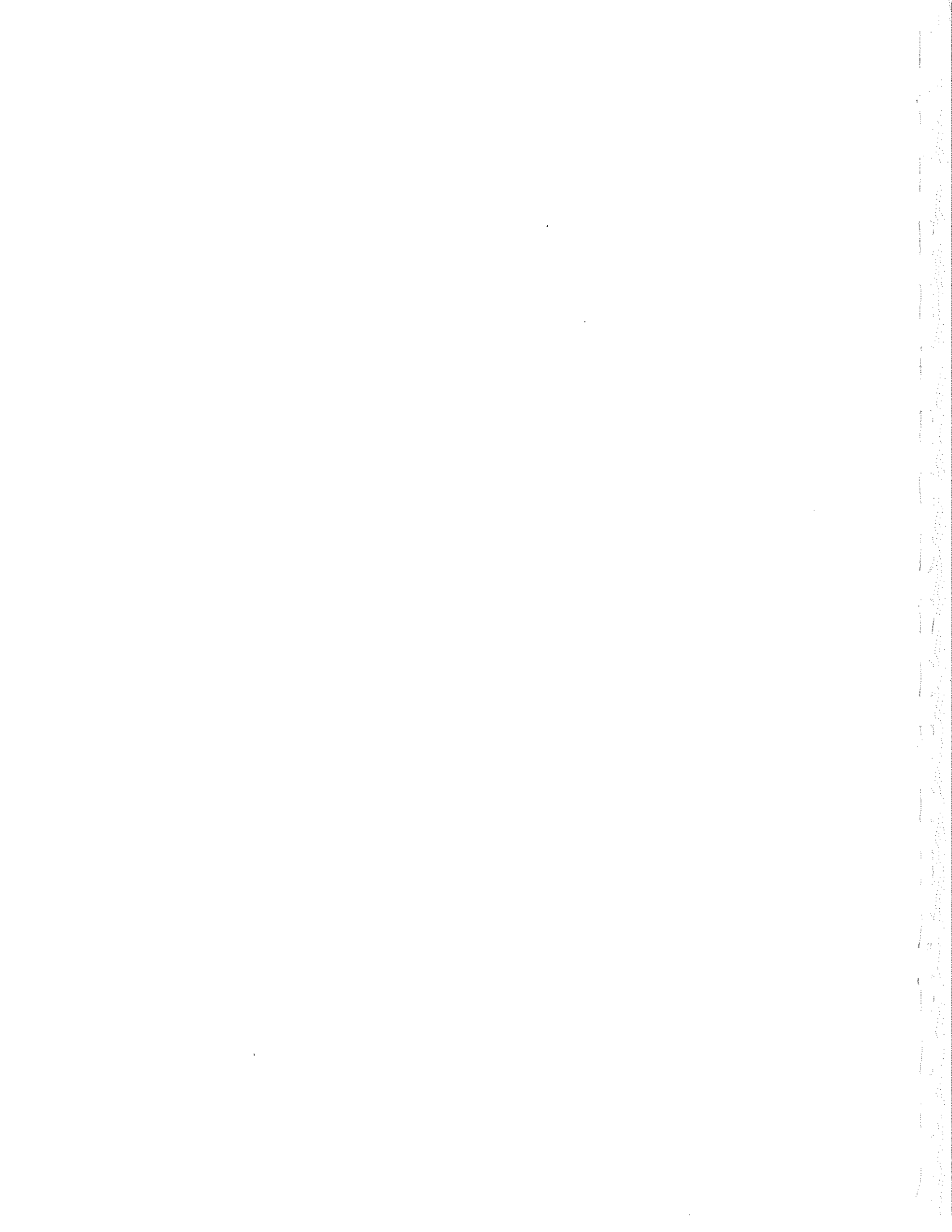
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END OF SECTION

1. The CONTRACTOR shall dispose of all manhole materials that are to be removed. Unless the OWNER designates a site for receiving the removed materials, the CONTRACTOR shall dispose of the materials at a site of his own choosing.

B. DISPOSAL OF MANHOLES

4. The ground or paved surface shall be restored in accordance with the drawings.



SECTION 02230

CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. The Contractor shall do all required clearing and grubbing within the Limit of Work, as shown on the Drawings, and shall remove all debris resulting therefrom.

B. Unless otherwise noted, all areas to be cleared shall also be grubbed.

1.02 RELATED WORK:

Any trees and shrubs specifically designated by the Owner not to be cut, removed, destroyed, or trimmed shall be saved from harm and injury in accordance with Section 01570, ENVIRONMENTAL PROTECTION.

PART 2 - PRODUCTS: NOT APPLICABLE

PART 3 - EXECUTION

3.01 RIGHT TO WOOD AND LOGS:

The Owner shall have the right to cut and remove logs and other wood of value in advance of the Contractor's operations. All remaining logs and other wood to be removed in the course of clearing shall become the property of the Contractor.

3.02 CLEARING:

A. Unless otherwise indicated, the Contractor shall cut or otherwise remove all trees, saplings, brush and vines, windfalls, logs and trees lying on the ground, dead trees and stubs more than 1-foot high above the ground surface (but not their stumps), trees which have been partially uprooted by natural or other causes (including their stumps), and other vegetable matter such as shags, sawdust, bark, refuse, and similar materials.



SECTION 02240
DEWATERING

PART 1 - GENERAL

1.01 WORK INCLUDED:

This section specifies designing, furnishing, installing, maintaining, operating and removing temporary dewatering systems as required to lower and control water levels and hydrostatic pressures during construction; disposing of pumped water; constructing, maintaining, observing and, except where indicated or required to remain in place, removing of equipment and instrumentation for control of the system.

1.02 RELATED WORK:

A. Section 00890, PERMITS

B. Section 01570, ENVIRONMENTAL PROTECTION

C. Section 02300, EARTHWORK

D. Section 02252, SUPPORT OF EXCAVATION

1.03 SYSTEM DESCRIPTION:

A. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from the slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.

1.04 QUALITY ASSURANCE:

A. The CONTRACTOR is responsible for the adequacy of the dewatering systems.

B. The dewatering systems shall be capable of effectively reducing the hydrostatic pressure and lowering the groundwater levels to a minimum of 2 feet below excavation bottom, unless otherwise directed by the ENGINEER, so that all excavation bottoms are firm and dry.

C. The dewatering system shall be capable of maintaining a dry and stable subgrade until the structures, pipes and appurtenances therein have been demolished.

D. The CONTRACTOR shall be responsible for repair of any damage caused by his dewatering operations, at no cost to the OWNER.

END OF SECTION

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SECTION 02252

SUPPORT OF EXCAVATION

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. This section of the specification covers wood sheeting and bracing for support of excavations. The requirements of this section shall also apply, as appropriate, to other methods of excavation support and underpinning which the CONTRACTOR elects to use to complete the work.

B. The CONTRACTOR shall furnish and place timber sheeting of the kinds and dimensions required, complying with these specifications, where indicated on the drawings or ordered by the ENGINEER.

1.02 RELATED WORK:

A. Section 02300, EARTHWORK.

B. Section 02240, DEWATERING.

1.03 QUALITY ASSURANCE:

A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et seq.) Contractors shall be familiar with the requirements of these regulations.

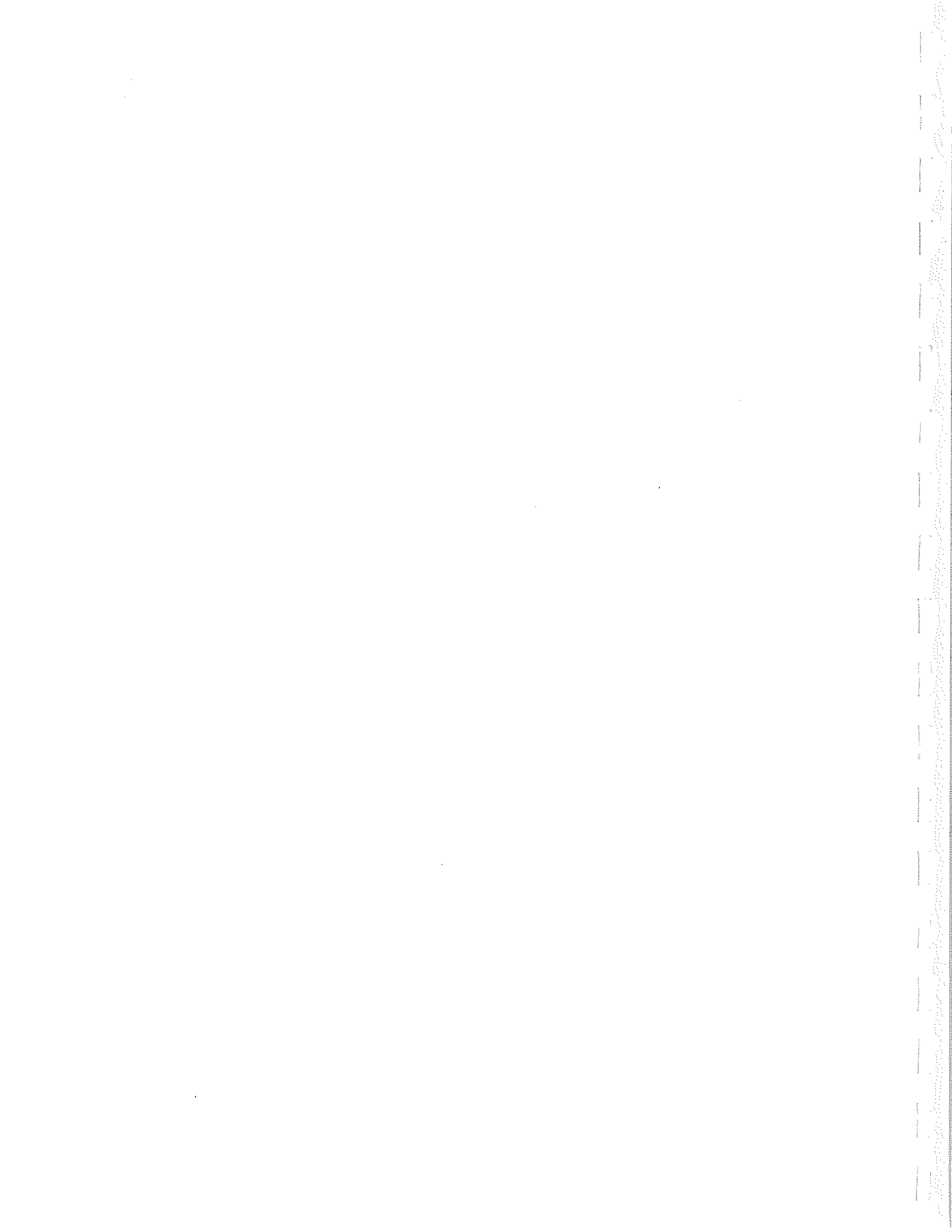
B. The excavation support system shall be of sufficient strength and be provided with adequate bracing to support all loads to which it will be subjected. The excavation support system shall be designed to prevent any movement of earth that would diminish the width of the excavation or endanger adjacent structures.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Timber sheeting shall be sound spruce, pine, or hemlock, planed on one side and either tongue and grooved or splined. Timber sheeting shall not be less than nominal 2 inches thick.

B. Timber and steel used for bracing shall be of such size and strength as required in the excavation support design. Timber or steel used for bracing shall be new or undamaged



SECTION 02280

EXCAVATION AND STOCKPILING OF CONTAMINATED MATERIAL

PART 1 - GENERAL

1.01 DESCRIPTION:

A. If encountered, furnish all labor, materials, equipment, and incidentals necessary to properly excavate, remove, and/or segregate contaminated soils including debris piles and other material for off-site disposal. The CONTRACTOR shall be responsible for analytical testing of soils for disposal and confirmatory purposes, as required by the disposal/recycling facility and ENGINEER.

B. The CONTRACTOR shall be responsible for installing soil borings and monitoring wells in excavated areas for confirmatory sampling. The CONTRACTOR shall assist the ENGINEER with compositing and packaging of confirmatory samples. The CONTRACTOR will be responsible for analytical testing of all confirmatory samples collected by the ENGINEER.

C. Contaminated materials may include soil, sediment, vegetation, sand, or debris removed from below grade for disconnection/abandonment of utilities, removed during underground storage tank removal activities, removed from below grade for demolition of below grade structures and foundations, segregated from stockpiles of soil and debris, and any other demolition activity associated with this contract.

1.02 RELATED WORK:

- A. Section 00890 - PERMITS
- B. Section 01380 - HEALTH AND SAFETY PLAN
- C. Section 01570 - ENVIRONMENTAL PROTECTION
- D. Section 01562 - DUST CONTROL
- E. Section 02075 - UNIVERSAL WASTE
- F. Section 02282 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL
- G. Section 02300 - EARTHWORK

1.05 DEFINITIONS:

- A. Contaminated Material: Soil, sediment, sand, vegetation, or debris indicated by analytical results to contain any contaminant concentrations equal to or greater than MCP reportable concentrations established by 310 CMR 40.0300 and 40.1600 or any reportable or cleanup concentration established in RCRA or TSCA.

1.06 QUALITY CONTROL:

- A. The CONTRACTOR shall engage the services of a Licensed Site Professional (LSP) prior to and during the course of the Work. The CONTRACTOR's LSP shall:

- 1. Meet all requirements for LSPs as defined in MGL c. 21A and as adopted by the Board of Registration of Hazardous Waste Site Cleanup Professionals under 309 CMR 1.00 through 8.00, and

- 2. Be certified as having completed the 40-hour OSHA health and safety training course, with current 8-hour OSHA refresher training.

- B. The responsibilities of the CONTRACTOR's LSP shall include, but not be limited to, the following:

- 1. Evaluation of existing analytical data and performance of any additional sampling, at no additional cost to the OWNER, required for the removal of contaminated materials to meet all state and federal regulations and disposal requirements.

- 2. Preparation of draft hazardous waste manifests and/or Bills-of-Lading (BOLs) for transportation of contaminated materials shall be submitted to the Engineer for review and comment. The OWNER's LSP (the ENGINEER) shall sign all BOLs prepared by the CONTRACTOR upon final approval and signature by the OWNER and/or his designated representative.

- 3. Preparation of necessary documents to support MCP response actions for oil and/or hazardous material releases resulting from CONTRACTOR activities. These documents shall be submitted to the ENGINEER for review prior to submittal to any regulatory agency.

- 4. Preparation, signing, and stamping of all final LSP Opinions submitted to DEP for any response actions taken during the project for releases of oil and/or hazardous materials caused by the CONTRACTOR.

- 5. Collection and laboratory analysis of confirmatory samples.

- C. The work shall conform to local, state and federal regulatory agencies governing the handling of contaminated soils and hazardous materials.

1. The CONTRACTOR shall perform all sampling and analysis of contaminated material as required by the receiving facility. The CONTRACTOR is responsible for reviewing available data within the Contract or at the ENGINEER's office. This

A. The CONTRACTOR shall be responsible for characterizing the material for the purpose of obtaining approvals from the disposal facility(ies).

3.04 CHARACTERIZATION:

B. The excavated contaminated material shall not be "blended" with other excavated material and shall be excavated in a manner that will allow the material to be segregated and separately stockpiled.

A. Carefully excavate areas of suspected contaminated material to avoid cross-contamination of the areas as directed by the ENGINEER.

3.03 EXCAVATION OF CONTAMINATED MATERIAL:

F. The CONTRACTOR shall not backfill the excavation until the ENGINEER has given approval to do so. The CONTRACTOR shall expect at least a three (3) day period for time to confirm that the appropriate limits of excavation has been determined.

E. The ENGINEER may stop the CONTRACTOR's work in a particular location at any time in order to have samples taken and analyzed. If necessary, the CONTRACTOR shall assist the ENGINEER in collecting samples. The work shall not resume in that area until directed by the ENGINEER. Stoppage of work for this reason, or until laboratory results are delivered to the ENGINEER, shall not be a cause for the CONTRACTOR to request additional compensation or an extension of time to the Contract or to other intermediate Contract deadlines.

D. All analyses shall be performed by a laboratory certified for such analyses by the Commonwealth of Massachusetts.

C. Take samples in such a manner as not to cause any cross-contamination. All sampling equipment shall be decontaminated between usage.

B. Submit a copy of all chemical analyses to the ENGINEER within 2 days of receipt of the laboratory report.

A. All sampling and analysis performed by the CONTRACTOR shall be at no additional cost to the OWNER.

3.02 SAMPLING:

MATERIAL.

D. Based upon the analytical results, transport and dispose of the excavate as specified in Section 02282 - TRANSPORTATION AND DISPOSAL OF CONTAMINATED

40 soil samples from the borings. The ENGINEER will give these samples to the CONTRACTOR who will send each sample to a DEP-certified laboratory for laboratory analysis of volatile and extractable petroleum hydrocarbons (including target analytes) using the DEP-approved method, PCBs using EPA Method 8082, and RCRA 8 Metals using EPA Methods 6010/7060/7421/7740/7741. All laboratory data from confirmatory sampling shall be sent to the Engineer within two days of receipt.

C. The CONTRACTOR shall NOT backfill any excavation until laboratory results from post-excavation confirmatory sampling are received and reviewed by the ENGINEER or unless the ENGINEER approves backfilling.

END OF SECTION

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SECTION 02282

TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL

PART 1 - GENERAL

1.01 DESCRIPTION:

- A. The intended purpose of the Section is to address the transport and disposal of contaminated material that may be encountered during the course of the Work.
- B. Furnish all labor, materials, equipment, and incidentals necessary to transport and dispose of contaminated materials. Work includes preparing Bills of Lading and Hazardous Waste Manifests as required, obtaining approval from disposal facilities for disposal, and loading and hauling of excavated materials.
- C. Excavated materials not approved by the OWNER for backfilling because of physical or chemical characteristics shall be disposed of as specified herein.

1.02 RELATED WORK:

A. Section 00890 - PERMITS

B. Section 01380 - HEALTH AND SAFETY PLAN

C. Section 01570 - ENVIRONMENTAL PROTECTION

D. Section 02075 - UNIVERSAL WASTE

E. Section 02280 - EXCAVATION AND STOCKPILING OF CONTAMINATED MATERIAL

F. Section 02300 - EARTHWORK

1.03 SUBMITTALS:

- A. Submit to the ENGINEER, for review, and in accordance with the requirements of the general specifications, the information required by Paragraph 1.03 B., no more than 14 days after issuance of the Notice to Proceed:

B. The CONTRACTOR shall include the following information in the Hazardous Materials Management Plan (HMMP) specified in Section 02280:

- 1. All pertinent information relating to the transport of contaminated material. The information, at a minimum, shall include:

- a. Name and address of all transporters.

1. WSC-94-400, Interim Remediation Waste Management Policy for Petroleum Contaminated Soils.

2. WSC-94-320, Construction Activities in Contaminated Areas.

3. COMM-97-001, Reuse and Disposal of Contaminated Soils at Massachusetts Landfills.

B. Massachusetts Contingency Plan (MCP), 310 CMR 40.0000.

C. Toxic Substances Control Act (TSCA), 40 CFR 761.00.

D. 310 CMR 30.0000 and the Resource Conservation Recovery Act (RCRA), 40 CFR 148 and 268.

E. All other applicable federal, state, and local regulations.

1.05 DEFINITIONS:

A. Contaminated Material: Soil, sediment, sand, vegetation, or debris indicated by analytical results to contain any contaminant concentrations equal to or greater than MCP reportable or concentrations established by 310 CMR 40.0300 and 40.1600 or any reportable or cleanup concentration established in RCRA or TSCA.

B. Unregulated Material: Soil, sediment, sand, vegetation, or debris indicated by analytical results to contain any contaminant concentrations lower than all MCP reportable or concentrations established by 310 CMR 40.0300 and 40.1600 and any reportable or cleanup concentration established in RCRA or TSCA.

1.06 PERMIT REQUIREMENTS:

A. The CONTRACTOR shall obtain all Federal, State, and local permits required for the transport and disposal of contaminated soil. The CONTRACTOR shall adhere to all permit requirements.

B. The CONTRACTOR shall document that the disposal facilities proposed have all certifications and permits as required by Federal, State, and local regulatory agencies to receive and dispose of the contaminated soil.

PART 2 - PRODUCTS

2.01 GENERAL:

A. All CONTRACTOR personnel shall wear personal protective equipment and protective clothing consistent with the levels of protection for this Work as indicated in Section 01380, HEALTH AND SAFETY PLAN.

D. Contaminated material shipped to a Group A, B, or C disposal facility must meet the established, fully operational, appropriately insured, and be operating in compliance with all applicable local, state, and federal regulations.

C. Material under Groups A, B, and C shall be handled using a Bill of Lading. The CONTRACTOR shall submit the proposed landfill or facility to the Authority for review and approval prior to transportation of material.

3. Group C: Contaminated material which meets the criteria set forth in DEP Policy WSC-94-400 for recycling at licensed asphalt recycling facility or meets the criteria for thermal treatment at an out-of-state thermal treatment processing facility. Contaminated material included in Group C includes material containing concentrations of polychlorinated biphenyls less than 50 milligrams per kilogram.

2. Group B: Material which meets DEP criteria for disposal at in-state Lined Landfills, to be used as daily cover, intermediate cover, and pre-cap contouring material. The material must not exceed the contaminant levels listed in DEP Policy #COMM-97-001.

1. Group A: Material which meets DEP criteria for disposal at in-state Unlined Landfills, to be used as daily cover, intermediate cover, and pre-cap contouring material. The material must not exceed the contaminant levels listed in DEP Policy #COMM-97-001.

B. The CONTRACTOR shall transport the material for off-site disposal or treatment at a DEP-approved landfill or facility based on the following categories:

A. Group A, B, and C materials contain oil and/or hazardous materials at concentrations equal to or greater than a release notification threshold specified in the MCP (310 CMR 40.0000), and are not hazardous waste as specified in the MCP, 310 CMR 30.0000, and all other state and federal regulations.

3.03 GROUPS A, B, AND C - CONTAMINATED MATERIAL WITH CONCENTRATIONS ABOVE REPORTABLE THRESHOLDS:

B. Unregulated material may be reused on-site where applicable and in accordance with Section 02300 - EARTHWORK or otherwise disposed off-site in accordance with the requirements of this Section.

A. Unregulated material containing concentrations lower than all MCP reportable concentrations established by 310 CMR 40.0300 and 40.1600 and any reportable or cleanup concentration established in RCRA or TSCA.

3.02 UNREGULATED MATERIAL - MATERIAL WITH CONCENTRATIONS BELOW REPORTABLE THRESHOLDS:

- 2. All documentation for each load shall be tracked by the original manifest document number that was assigned by the ENGINEER at the site.
- 1. Documentation shall be provided for each load from the site to the disposal facility, including all manifests and any other transfer documentation as applicable.

- F. The CONTRACTOR shall submit to the OWNER, prior to receiving progress payment, documentation certifying that all materials were transported to, accepted, and disposed of, at the selected disposal facility. The documentation shall include the following, as a minimum.
 - E. The CONTRACTOR shall furnish all generator copies of the Hazardous Waste Manifest to the OWNER for submittal to the appropriate regulatory agencies and to retain for the OWNER's records.
 - D. The OWNER (or his designated representative) will be designated as generator and will sign all manifests and waste profile application or questionnaires.
 - C. The CONTRACTOR shall also provide certified tare and gross weight slips for each load received at the designated facility which shall be attached to each returned manifest.
 - B. The CONTRACTOR shall prepare all Hazardous Waste Manifests, Bills of Lading, and material shipping records with all applicable analytical backup, notification, and control forms. Final copies of Bills of Lading shall be signed by the OWNER (or his designated representative) as generator following submission and approval by the ENGINEER of draft Bills of Lading.
 - A. The CONTRACTOR shall prepare and submit to the OWNER for review all waste profile applications and questionnaires, and coordinate with disposal facilities and all Federal and State Environmental Agencies. Refer to Paragraph 1.03 B.

3.06 WASTE PROFILES AND MANIFESTS:

- E. The CONTRACTOR shall provide certified tare and gross weight slips for each load received at the accepted Facility which shall be attached to each returned manifest.
- D. The tare and gross weight for every vehicle, container, and trailer shall be measured to determine the net weight.
- C. The CONTRACTOR will operate the scale and allow inspection by the ENGINEER. The tare and gross weight for every vehicle, container and trailer shall be measured to determine the net weight for use in validating net weights recorded at Facilities.
- C. The CONTRACTOR shall remove the scale at the completion of the Work specified under this Section.

C. The CONTRACTOR shall provide to the ENGINEER copies of all weight slips, both tare and gross, for every load weighed and disposed of at the approved facility. The slips shall be tracked by the original manifest document number that was assigned by the ENGINEER at the site. The ENGINEER shall make progress payments after receipt of these weight slips.

3.09 TRUCK ROUTE:

A. The CONTRACTOR shall comply with the Truck Route as shown on the Drawings and/or specified.

B. The CONTRACTOR must adhere to this specific Truck Route throughout the duration of this Contract.

C. Any adjustments to the Truck Route shall be approved by the ENGINEER prior to using an alternate route.

3.10 LOGS, REPORTS, AND RECORDKEEPING:

A. At a minimum, the CONTRACTOR shall maintain daily logs and reports covering the work to be performed for this Section of the Contract. The format shall be developed by the CONTRACTOR to include daily logs, weekly reports, and a phase out report. The CONTRACTOR shall provide ENGINEER with copies of all logs and reports on a weekly basis.

B. Daily Logs shall include, at a minimum, the following:

1. Date
2. Area (site specific) of work being performed
3. Equipment being utilized by employees
4. Type of work performed
5. References to manifests, bills of lading, and waste profiles
6. Sample locations and sample identifications
7. Details and documentation of remediation waste management
8. Protective clothing being worn by employees
9. Project manager or CONTRACTOR's LSP signature and date

C. Weekly Reports shall include, at a minimum, the following:

1. A summary of the work performed during the week
2. Copies of the daily logs.

D. Phase Out Report shall include, at a minimum, the following:

1. Summary of work performed under this Section of the Contract
2. Copies of all manifests, bills of lading, and waste profiles
3. Laboratory reports and plans indicating sample locations
4. Contractor's LSP signature and date

END OF SECTION



SECTION 02300
EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDED:

The CONTRACTOR shall make excavations of normal depth in earth for trenches and structures, shall backfill and compact such excavations to the extent necessary, shall furnish the necessary material and construct embankments and fills, and shall make miscellaneous earth excavations and do miscellaneous grading.

1.02 RELATED WORK:

A. Section 01110, CONTROL OF WORK AND MATERIALS

B. Section 00890, PERMITS

C. Section 01570, ENVIRONMENTAL PROTECTION

D. Section 02230, CLEARING AND GRUBBING

E. Section 02240, DEWATERING

F. Section 02252, SUPPORT OF EXCAVATION

G. Section 02920, LOAMING AND SEEDING

1.03 REFERENCES:

American Society for Testing and Materials (ASTM)

| | | |
|------|-------|--|
| ASTM | C131 | Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine. |
| ASTM | C136 | Method for Sieve Analysis of Fine and Coarse Aggregates. |
| ASTM | C330 | Specification for Lightweight Aggregate for Structural Concrete. |
| ASTM | D1556 | Test Method for Density of Soil in Place by the Sand Cone Method. |
| ASTM | D1557 | Test Methods for Moisture-density Relations of Soils and Soil Aggregate Mixtures Using Ten-pound (10 Lb.) Hammer and Eighteen-inch (18") Drop. |

PART 2 - PRODUCTS

2.01 MATERIALS:

A. GRAVEL BORROW: Gravel Borrow shall satisfy the requirements listed in MHD Specification Section M1.03.0, Type b.

B. CRUSHED STONE: Crushed stone shall satisfy the requirements listed in MHD Specification Section M2.01. SAND BORROW: Sand Borrow shall satisfy the requirements listed in MHD Specification Section M1.04.0.

D. PEASTONE: PEASTONE: Peastone shall be smooth, hard, naturally occurring, rounded stone meeting the following gradation requirements:

| | | |
|---------------------------------------|---|------|
| Passing 5/8 inch square sieve opening | - | 100% |
| Passing No. 8 sieve opening | - | 0% |

E. BACKFILL MATERIALS:

1. Class B Backfill: Class B backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter; with 30 percent or less passing the No. 200 sieve; no stone greater than two-third (2/3) loose lift thickness, or six inches, whichever is smaller.

2. Select Backfill:

Select backfill shall be granular, well graded friable soil, free of rubbish, ice, snow, tree stumps, roots, clay and organic matter, and other deleterious or organic material; graded within the following limits:

| | |
|-------------------|--------------------------------|
| <u>Sieve Size</u> | <u>Percent Finer by Weight</u> |
| 3" | 100 |
| No. 10 | 30-95 |
| No. 40 | 10-70 |

and replacement shall be borne by the CONTRACTOR.

If, in the opinion of the ENGINEER, the subgrade, during trench excavation, has been disturbed as a result of rain, surface water runoff or groundwater seepage pressures, the CONTRACTOR shall remove such disturbed subgrade to a minimum of 12 inches and replace with crushed stone wrapped in filter fabric. Cost of removal

scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed.

If pipe is to be laid in embankments or other recently filled areas, the fill material shall first be placed to a height of at least 12-inches above the top of the pipe before excavation.

Where pipe is to be laid in bedding material, the trench may be excavated by machinery to, or just below, the designated subgrade provided that the material remaining in the bottom of the trench is not disturbed.

Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, and depths of cover indicated on the Drawings. Trench widths shall be as shown on the Drawings or as specified.

The CONTRACTOR shall satisfy all dewatering requirements specified in Section 02240 Dewatering, before performing trench excavations.

Prior to excavation, trenches in pavement shall have the traveled way surface cut in a straight line by a concrete saw or equivalent method, to the full depth of pavement. Excavation shall only be between these cuts. Excavation support shall be provided as required to avoid undermining of pavement. Cutting operations shall not be done by ripping equipment.

B. TRENCHES:

The CONTRACTOR shall excavate unsuitable materials to stable natural ground where encountered at proposed excavation subgrade, as directed by the ENGINEER. Unsuitable material includes topsoil, loam, peat, other organic materials, snow, ice, and trash. Unless specified elsewhere or otherwise directed by the ENGINEER, areas where unsuitable materials have been excavated to stable ground shall be backfilled with compacted special bedding materials or crushed stone wrapped all

around in non-woven filter fabric.

The CONTRACTOR shall follow a construction procedure, which permits visual identification of stable natural ground. Where groundwater is encountered, the size of the open excavation shall be limited to that which can be handled by the CONTRACTOR'S chosen method of dewatering and which will allow visual observation of the bottom and backfill in the dry.

The CONTRACTOR shall follow a construction procedure, which permits visual

B. Surplus excavated materials, which are acceptable to the ENGINEER, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the ENGINEER, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the OWNER, within its jurisdictional limits; all at no additional cost to the OWNER.

A. No excavated material shall be removed from the site of the work or disposed of by the CONTRACTOR unless approved by the ENGINEER.

3.04 DISPOSAL OF SURPLUS MATERIALS:

5. Should the ENGINEER order crushed stone, the CONTRACTOR shall furnish and install the crushed stone as directed.

4. If the materials above the trench bottom are unsuitable for backfill, the CONTRACTOR shall furnish and place backfill materials meeting the requirements for trench backfill, as shown on the drawings or specified herein.

3. Class B backfill shall be placed from the top of the select backfill to the specified material at grade (loam, pavement subbase, etc.). Fill compaction shall meet the density requirements of this specification.

2. Unless otherwise indicated on the Drawings, select backfill shall be placed by hand shovel in 6-inch thick lifts up to a minimum level of 12-inches above the top of pipe. This area of backfill is considered the zone around the pipe and shall be thoroughly compacted before the remainder of the trench is backfilled. Compaction of each lift in the zone around the pipe shall be done by use of power-driven tampers weighing at least 20 pounds or by vibratory compactors. Care shall be taken that material close to the bank, as well as in all other portions of the trench, is thoroughly compacted to densities required.

1. As soon as practicable after pipes have been disconnected and plugged, backfilling shall be started.

B. TRENCHES:

6. If the material removed from the excavation is suitable for backfill with the exception that it contains stones larger than permitted, the CONTRACTOR has the option to remove the oversized stones and use the material for backfill or to provide replacement backfill at no additional cost to the OWNER.

5. Where horizontal layers meet a rising slope, the CONTRACTOR shall key each layer by benching into the slope.

Attach ment

See

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Attachment

Attachment

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